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PATHOLOGICAL CONDITIONS ARISING IN DUPLICATION OF THE KIDNEY PELVIS AND URETER: REPORT OF TWELVE CASES*

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The occurrence of duplication of the kidney pelvis and ureter is of statistical interest only. The fact, however, that surgical complications are more prone to develop in the presence of such anomalies makes them of great clinical significance.

The purpose of this paper is to add to the literature twelve cases of duplication of the kidney pelvis and ureter, ten in which pathological complications occurred.

It is now generally recognized that duplication of the kidney and ureter occur in from 1 to 4 per cent of all individuals. With such an incidence it is not unlikely that they are frequently unrecognized by the cystoscopist. In 51,504 autopsy records, Botez[1] found the frequency of horseshoe kidney to be one in 715; in a series of 1,000 kidney operations the proportion was one to 143, or five times as great. Botez concludes from this that a horseshoe kidney is more likely to become diseased than a normal one. From this it may be surmised that all abnormalities of the kidneys and ureters are more prone to pathological complications.

While various anomalies and many variations of the same anomaly may occur in the kidney and ureter, it is interesting to note that perhaps 85 per cent of the anomalies occur in only a few forms. Papin and Eisendrath[2] (1927) presented a classification of the various anomalies of the upper urinary tract, illustrating the different groups in a diagrammatic way. It is interesting to note that in this classification numerous diagrams are required to illustrate the different forms. While it is true that these anomalies may be present in a varied number of forms, it is interesting to note from the study of the different reviews that the majority of abnormalities assume one of only a few forms. In the 144 cases of duplication of the renal pelvis and ureter observed in the Mayo Clinic[3] from 1907 to 1922, unilateral duplication occurs in 94 per cent and incomplete unilateral duplication in 68.7 per cent. By far the most frequent renal anomaly encountered is the division of the ureter into a Y in the upper third on one side.

The diagnosis of anomalies of the kidneys and ureters is not difficult. Careful inspection of the mucosa of the bladder for two ureteral openings on one side and a uretero-pyelogram properly executed will reveal most of them. The patient should be carefully prepared for cystoscopy by means of castor oil the night before and enemas the morning of the cystoscopy. Quite frequently a flat plate will reveal an enlarged kidney on one side or something abnormal in the contour of one kidney. The use of indigo carmine, as suggested by Mertz,[4] facilitates the discovery of double ureter. An aberrant ureter, opening into the posterior urethra or vagina, may be suspected from the symptomatology and diagnosed by means of indigo carmine and pyelography.

Sometimes an extra ureteral opening may resemble a fold of the bladder mucosa, especially if one meatus on this side has already been seen and if the two meatus are far apart. The use of a catheter will clear up the diagnosis.

A uretero-pyelogram usually offers the most

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information in either complete or incomplete duplication, especially if the upper pelvis has been outlined. In making a uretero-pyelogram it is always important to withdraw the ureteral catheter first before and as the plate is being taken, for in this way a Y ureter is more likely to be outlined.

Uroselectan frequently is of great value in demonstrating anomalies where ureteral catheterization is not practical nor advisable; as in children, hypertrophy of the prostate gland, bladder tumors, stones and acute inflammatory conditions of the bladder.

The finding of a large amount of kidney substance above or below the infected pelvis suggests the possibility of a duplicated kidney (Pohlman[5]). A high lying small pelvis is always suggestive of a duplicated kidney.[3] A small pelvis with abbreviated calyces is always suspicious. If the upper true pelvis is unusually long and narrow, and the lower calyx does not extend below the true pelvis, duplication is to be suspected.

The study of the surgery of the kidneys and ureters in duplications is interesting. In 30 per cent of the 300 cases reported by Mertz,[4] and in 37.5 per cent of the 144 cases reported by Braasch and Scholl,[3] pathological complications occurred. Of the more frequent pathological conditions met with in duplication of the renal pelvis and ureter, may be mentioned hydronephrosis and pyonephrosis, which comprise nearly 50 per cent. Of the other pathologic conditions occasionally met with may be mentioned renal tuberculosis, atrophic pyelonephritis, aberrant ureters with ectopic openings, unilateral infection, ptosis and tumors.

It is interesting to note that nephrectomy is by far the most common surgical procedure. Other operations occasionally performed may be mentioned, such as heminephrectomy, pelviolithotomy, ureterolithotomy, operations on anomalous vessels to relieve obstruction, and ligation of aberrant ureters.

In the following case a stone was removed in 1921 from the upper pelvis of a double kidney on the left and in 1925 the patient returned with more stones.

Case 1.—A man aged 35 (D. M. G. 14568) came to the Clinic in 1921 complaining of some frequency and dysuria. Between 1911 and 1913 he had had a number of attacks of pain in the left side associated with burning and frequency of urination. In 1919, during one of these attacks, he passed three stones. A flat plate revealed a large left kidney with a definite stone shadow in the pelvis. On cystoscopy there was found to be no infection on the right, but 10-12 pus cells to the high power field on the left. A pyelogram on the left showed the stone to be in the upper pelvis of the duplicated kidney. A pelviolithotomy was done and a stone removed. Six months later he had an attack of pain in the left side and passed some gravel. Since then he has had an occasional attack of frequency and burning on passing his urine. At the present time (1925) he returned for examination complaining of frequency and dysuria, which has been present for three weeks. A flat plate shows multiple shadows on the left side in the kidney region. On cystoscopic examination the bladder mucosa presented evidence of a subacute cystitis. The ureteral openings were observed without difficulty and a catheter passed up each ureter with difficulty. Differential 'phthalein revealed a 50 per cent function on the left with a normal function on the right. An air pyelogram showed the shadows on the left to be included in the upper pelvis of a duplicated kidney, also a single shadow was outlined in the lower pelvis. There was a division of the ureter into a Y in the upper third. Both pelves were outlined with air. Due to the marked amount of infection present, the lowered function, and the multiple stones, a nephrectomy was resorted to. The patient made an uneventful recovery.

The patient died May 15, 1929, from what was diagnosed as Bright's disease. Swelling of the feet and legs and shortness of breath were the chief symptoms.

Fig. 1, Case 1
Stone removed from upper pelvis in 1921. Nephrectomy same side 1925 for recurrence.

The following case is one of the two to be presented in which a nephrectomy was performed on the diseased single kidney, leaving the normal double kidney on the other side to maintain life.

Case 2.—A woman, aged 29 (Mrs. W. R. A., 13282), came to the Clinic November 17, 1924, complaining of pain in the back and frequency of urination. For the preceding six months she has been troubled with frequency and some dysuria. Following ureteral catheterization elsewhere a few weeks previously, she developed an acute attack of pain in the left side which lasted about two days. Five years before she had three attacks of kidney colic, coming on a month or so apart; the pain was quite severe and had to be relieved with morphine.

The patient was five feet five inches high, weighed 130 pounds and appeared in very good general health. Her blood pressure was 130/80. The abdomen was essentially negative except for tenderness in the region of the left kidney. A catheterized specimen of urine contained 10-20 pus cells to the high power field. A flat plate revealed a large shadow on the left side, probably stone, which apparently filled the kidney pelvis and projected down into the inferior calyx. On cystoscopic examination two ureteral openings were seen on the right, while only one could be found on the left. Clear spurts of urine were observed from each of the double orifices on the right. However, practically no urine was seen in five minutes' observation on the left. The two kidneys on the right were catheterized, the cystoscope was reinserted and the one on the left catheterized. Urine obtained from the double kidney on the right showed no infection and a 'phthalein return of 8 per cent (upper) and 10 per cent (lower) in fifteen minutes, respectively. The urine obtained from the left side showed 20-30 pus cells to the high power field with many pus cell clumps. The function on this side, as determined by the 'phthalein test, was only 5 per cent for the fifteen minutes. A pyelogram was done on the right side which revealed considerable dilatation in the minor calyces and true pelvis and dilatation of the ureter. A diagnosis of left pyelonephritis and ureteritis was made, with destruction of about 50 per cent of the kidney's function. The patient was put on pelvic lavage and urinary antiseptics. After a few weeks of such treatment she again had an acute attack of pain on this side, associated with fever. This attack lasted about a week. All treatment was discontinued for about three weeks. The patient returned at this time, still complaining of pain in the left side. Nephrectomy of the single diseased right kidney was advised and the kidney was removed. Ten years later the patient was well.

Fig. 2, Case 2
Large stone in left kidney. Complete healthy double ureters and pelves on right.

The following case is similar to the one just cited, in that the diseased right kidney was removed, leaving a double kidney on the left to maintain life.

Case 3.—Mrs. J. A. McG. (3168), age 41, came to the Clinic July 3, 1920, complaining of a dull, aching pain in the back and right side. On occasions during the preceding three years she had been confined to bed with chills and fever. She had probably had 15 or 20 such attacks during the previous eight years. Two years before she had had her appendix removed, but got no relief from this operation. Pus has been found in her urine more or less constantly for the previous year. Physical examination revealed a rather undernourished individual about five feet four inches in height, weighing 103 pounds. Aside from a slight tenderness on the right side the general examination was negative. The catheterized urine revealed from 15-20 pus cells to the high power field, with an occasional clump. A flat plate of the abdomen was negative. On cystoscopic examination, two ureteral openings were observed on the left side. A No. 5 radiographic catheter passed up each of the double ureters on the left side without difficulty. The cystoscope was reintroduced and the right ureter catheterized. The function of the right kidney was greatly reduced; the function of the double left kidney was normal and equal in each part. The urine from each part of the double kidney was clear and revealed no infection, while the urine from the right single kidney contained a number of pus cell clumps and from 10-20 pus cells to the high power field. A diagnosis of right nephrolithiasis with infection was made. The condition of the anomaly on the left side was discussed both with the patient and with her family. We rather hesitated to advise nephrectomy of the diseased kidney. A few weeks later the patient returned, still having pain on this side and frequency and dysuria. A right nephrectomy was done. The patient was alive and well six years after the operation.

The following case is of great interest in that

it brings up the question of differential diagnosis:

Case 4.—A woman (Mrs. S. M. R., 22696), age 68, was referred to the Clinic September 20, 1928, because of the finding of a mass in the left side during a general physical examination. For the previous four or five weeks she had noted some discomfort in the right kidney region and on one occasion, about three weeks before, she noticed quite severe pain. The mass had been found accidentally by the patient only six weeks before she went to her physician. A maiden aunt had died of carcinoma of the breast at the age of 60 and she had lost one sister at the age of 45 with carcinoma of the stomach. She had lost about ten pounds in weight during the previous three months. General examination was negative except for the finding of a mass in the left side, which moved on respiration and felt like an enlarged kidney. The urine was negative for pus, containing only 2-4 pus cells to the high power field, but contained sugar. (The patient had diabetes.) A flat plate after careful preparation showed a kidney about twice the normal size on the left side with a normal kidney shadow on the right (see plate). On cystoscopic examination both ureteral openings appeared normal and clear spurts of urine were observed from each. A catheter was passed up each side. On the left side slight obstruction was met a short distance from the uretero-vesical junction, but there was no grating. This obstruction was easily passed. The urine from each kidney showed no infection. The pyelogram on the left side, made with the catheter well into the pelvis, showed a rather long major pelvis, the lower major calyx coming off high up and above the major part of the true pelvis. This was diagnosed as possibly the upper pelvis of a double kidney. About three inches below the pelvis there was a suspicion of a Y ureter for a distance of an inch, but we could not be sure of this due to the possibility of slight movement on the part of the patient. When the patient returned in a week, this side was catheterized again. At this sitting the catheter was slowly drawn down as the ureter was filled and, as we suspected, the lower pelvis of a double kidney was outlined. There was nothing in either pelvis to suggest a tumor, although the calyces were somewhat blocked off, which was thought to be due to pressure. The case was referred to a general diagnostician for study. Before this examination could be completed the patient became ill with chills and fever and extreme tenderness in the left side. She was put in the hospital, where she continued to run a daily temperature of 101 to 102°. Her diabetes was carefully controlled with insulin, but she continued to lose weight and to lose ground. Blood studies were done, gastrointestinal x-rays and colon rays. The colon ray was reported unsatisfactory, due to a large amount of gas. The patient had diarrhea, which had not been present previously. There was no blood in the stool.

Fig. 3, Case 4
Double pelvis and Y ureter on left.

The tenderness in the left side, together with the temperature and the considerable leucocytosis, 20,000 to 25,000, together with the presence of a mass, forced us to explore the case of a perinephritic abscess in spite of an apparently normal duplicated kidney pelvis. On October 12, 1930, the left kidney was explored. This was found to be normal in every respect, but was pushed down considerably by an extrarenal mass, apparently coming from the abdomen. When we attempted to explore this, we opened an abscess and evacuated about six ounces of pus. Due to the bad condition of the patient, it was decided to be content with drainage of this abscess. The patient did not respond very well and died a few days after this drainage. At post mortem an adenocarcinoma of the splenic flexure was found, which had ulcerated retroperitoneally and had formed a large abscess. In reviewing this case it is interesting to note that one colon x-ray had been ordered, but had been reported unsatisfactory. We should have insisted upon a satisfactory examination of the colon before being forced, as we were, to explore the double kidney on this side, which we had previously diagnosed normal.

In the following case a number of stones were removed by cystoscopic manipulation from one of the ureters of a double kidney:

Case 5.—A woman, age 67 (Mrs. J. H. S., 4803), was referred to the Clinic May 2, 1921, by her family physician because of pus in the urine. Seven years before she had an acute attack of pain in the left side and was confined to bed for several days. On two or three occasions during the previous two years she has been confined to bed with fever and chills and a considerable amount of pus in the urine. However, she did not have much pain during these attacks. A catheterized specimen contained numerous pus cells to the high power field. A flat plate of the abdomen showed numerous shadows in the right lower ureteral area.

On cystoscopic examination two ureteral openings

Fig. 4, Case 5
Complete duplication of ureters with ten stones in saccular dilatation of lower end of one of the ureters.

were observed on the right, while only one was seen on the left. The meatus nearest the trigone on the right was gaping, everted and reddened, and this ureter was found to contain stones. A double pyelogram on this side was done, leaving the catheters in both pelves to insure good drainage. It was seen that we were dealing with a complete unilateral duplication, in which there was practically no dilatation of either pelvis. One of the ureters contained multiple stones, while the other contained no stones, had a normal function, and had no infection. It was decided to attempt the removal of these stones by manipulation. Multiple catheters were passed up the ureter containing the stones and during a period of two weeks all of the stones from this side were removed, the largest measuring 2 x 1 cm., the smallest being about 5 x 5 mm. Ten stones in all were removed. The patient returned three times during the next three months and the urine each time contained some pus, 10-15 pus cells to the high power field. The cystitis, however, which was present at first examination, continued to clear up and had disappeared at the end of three weeks. The function on this side was fairly good and it was decided to leave the kidney alone, even though there was considerable infection in the ureter from which the stones had been removed. Four years later the patient had not had any further trouble with her kidneys. She died five years later from pneumonia.

In the following case, stones were found in the lower pelvis of a Y ureter and were not removed:

Case 6.—A man aged 59 (L. A. A., 13025), came to the Clinic November 1, 1924, complaining of pain in the right side and back. The pain had been present about three days and had been quite severe. He further stated that he had had several attacks of pain associated with some frequency during the previous five years. The attack usually lasted from two to three days. General examination revealed a rather slender anemic man, weighing 125 pounds. There was considerable tenderness on percussion over the right kidney. An examination of the urine showed 15-20 pus cells to the high power field. A flat plate revealed several shadows in the region of the right kidney. On cystoscopic examination the bladder mucosa was acutely inflamed. Both ureters were catheterized with difficulty. The urine from the right side contained no infection and was normal in function as determined by 'phthalein test. The urine from the left, however, contained 2-6 pus cells to the high power field, but had a normal function. A pyelogram was done on the right side to determine if the shadows present were included in the pelvis. The catheter was slowly withdrawn as the media was injected, and the pyelogram demonstrated a Y ureter in the upper third with all shadows included in the lower kidney pelvis. Because of the good function on this side and because the infection was slight, it was decided to treat the cystitis as the primary lesion. The patient remained from two to three weeks for bladder lavage and was discharged free from symptoms. Six months later the patient returned, stating that he had had one attack of chills and fever which lasted two days, but had otherwise been feeling quite well.

Fig. 5, Case 6
Double pelvis and Y ureter, right side. Stones in lower pelvis were not removed.

The next case is of interest in that it presents the most common pathological condition met with in double ureters and double kidneys, namely, hydronephrosis and pyonephrosis.

Case 7.—A woman, age 36 (Mrs. M. N., 1587), came to the Clinic November 2, 1920, complaining of frequency and dysuria. She had been subject to occasional attacks of pain in the left side for as long as she could remember. On several occasions during the past four or five years her urine had been examined and she had been told that it contained pus. On at least six or eight different occasions she had been in bed from two days to one week with pain in the left side, fever and occasional chills. The general physical examinations were essentially negative. A flat plate of the abdomen was reported negative. The catheterized bladder urine contained numerous pus cells. On cystoscopic examination, two ureteral openings were observed on the left side, but only one single meatus could be seen on the right. The urine obtained by catheterization from each part of the left double kidney contained numerous pus cells, 30-40 pus cells to the high power field. On the right side, however, there was a single kidney. The urine from this side contained no pus and there was a normal function. The function of the double kidney on the left was considerably lowered ('phthalein test) and it was possible to withdraw 30 c. c. of fluid from the catheter which was inserted into the meatus nearest the tri-gone. A diagnosis of complete duplication of the kidney and ureter on the left, with hydronephrosis and pyonephrosis, was made, and nephrectomy was advised.

In the following case, both pelves of a double kidney on the right contained large branched stones:

Case 8.—A man, aged 51 (J. S., 2240), came to the Clinic complaining of pain in the bladder region with occasional attacks of frequency and dysuria. He had been more or less bothered with a dull backache most of the time for the previous two years, but had been more or less free from severe attacks of pain. His general physical examination was negative. A flat plate of the abdomen revealed a branched stone completely filling each pelvis of an apparent double kidney on the right. On cystoscopic examination a radiographic catheter was inserted into the left meatus. The right side was not catheterized. Urine from this side showed no infection and a normal function as determined by 'phthalein test. On December 3, 1919, the right kidney was removed. It was about twice normal size and contained two ureters, both of which were ligated doubly. Examination of this specimen revealed a double kidney containing large branched stones in each pelvis. It was not determined where the division of the ureter occurred. However, no double meatus was observed in the bladder on this side. Ap-

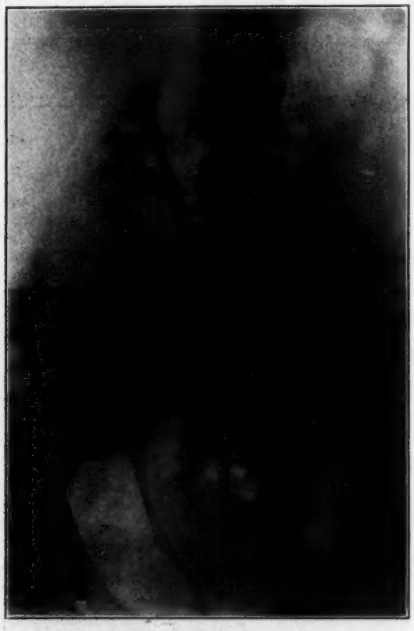

Fig. 6-A, Case 7

Right urogram showing double ureters throughout and double pelvis. Note the crossing of the two ureters. There was also complete duplication on the left.

Fig. 6-B, Case 7

Radiograph of left kidney after removal. This side showed complete duplication of ureter and pelvis with pychydronephrosis, especially of upper pelvis.

Fig. 7, Case 8
Large branched stones in both kidney pelves with infection. Nephrectomy. Recovery.

parently we were dealing with a unilateral incomplete duplication on this side.

Case 9.—C. S. (1416) was reported by Dr. Hamilton W. McKay in the SOUTHERN MEDICAL JOURNAL, June, 1926, under the title of "The Application of Modern Urologic Diagnostic Methods in Pediatrics: Case Reports."

This is a case of unilateral double ureter on the right with ectopic opening of one of the ureters into the posterior urethra. Dribbling and inability to keep dry were the chief complaints.

The following case is of interest in that a Y ureter was found in a man of 69 with some evidence of pyelonephritis, who had not had much kidney trouble previously, the man at this time suffering from symptoms of prostatic obstruction.

Case 10.—A patient, 69 years old (P. A. S., 14048), came to the Clinic September 7, 1923, complaining of difficulty in urination. He stated that for the previous three years he had had increasing difficulty in emptying his bladder. His stream was also diminished in force. In going further into the history, it was ascertained that he had had probably five or six attacks of acute pain in the left side. These attacks of pain had been associated with fever and some frequency and had recurred at different intervals during the preceding ten years. His last attack was fifteen weeks before.

The urine contained 15-20 pus cells to the high power field. A flat plate of the abdomen was essentially negative; on rectal examination the prostate was enlarged about 3 plus on a basis of four. A check showed a residual urine of four ounces. The 'phthalein was normal; the blood urea was normal. A diagnosis of prostatic hypertrophy was made with four ounces of residual urine. The prostate was removed. The recovery was uneventful. Before going home, on account of the history of recurrent attacks of pain in the left side, the patient was cystoscoped. Both sides were catheterized. It was found that while no infection was obtained on the right, an infection of 6-10 pus cells was obtained on the left. A pyelogram on the left revealed a Y ureter in the upper third. A diagnosis of recurrent pyelonephritis was made, but since very little dilatation was observed in either of the duplicated pelves and since the patient was 69 years old, no further cystoscopy or surgery was advised.

The next case is of interest in that it is a case of six months pregnancy, complicated by pyelonephritis, Y ureter being found on the left:

Case 11.—A patient, aged 20 (Mrs. J. H. E., 18546), came to the Clinic March 5, 1927. She stated that she was about six months pregnant. Three months previously she noticed a dull pain in the region of the left kidney, which was accompanied by intermittent elevation of temperature and a feeling of general weakness and fatigue. At this time the family physician made a diagnosis of pyelitis of pregnancy and she was treated expectantly. However, vomiting soon began,

Fig. 8, Case 11
Y ureter left, patient six months pregnant.

and for the previous three weeks she had been unable to keep anything on her stomach. On general physical examination the patient was found to be very emaciated and weak. The uterus was the size of a five or six months pregnancy. The temperature was 102°. She appeared rather worn and pale. A flat plate of the abdomen was negative and a catheterized urine showed 4-6 pus cells to the high power field. Catheters were inserted into both ureters and left in for twenty-four hours. There was considerable infection on either side. The catheters were left in, to insure drainage, and fluids were forced both by rectum and subcutaneously. In spite of this treatment she continued to vomit. Consultation was obtained from the medical side and it was decided to interrupt pregnancy. On March 9, the uterus was emptied. The next morning the patient discontinued vomiting and she continued to improve from this time on. At the end of three weeks she had improved so much that urological examination could be continued. A pyelogram was done on the right side, which showed a normal kidney in every way. There was still slight infection on this side, 5-8 pus cells to the high power field. A pyelogram on the left side three days later showed a Y ureter in the upper third. However, there was no dilatation of either pelvis. The infection was moderate, 8-12 pus cells to the high power field. The patient continued to improve and was sent home in three weeks. A recent letter from her states that she has been perfectly healthy since. However, she has had no other pregnancies.

This case, of complete bilateral duplication of the kidneys and ureters, is interesting in that on only one side (the left) was a double ureteral opening found. The diagnosis was made from the pyelogram alone:

Case 12.—A man, aged 44 (Rev. G. F. B., 6727), came to the Clinic March 4, 1922, complaining of pus in the urine and nervousness. As a child the patient occasionally had had an attack of kidney colic associated with frequency and urgency. He also had a history of occasional attacks of chills and fever, at which times he usually remained in bed for a few days. The urine contained 10-20 pus cells to the high power field. A flat plate was negative for stones. On cystoscopy two ureteral openings were observed on the right, but owing to the irritability of the bladder, sufficient time was not spent in observation of the left side. The ureteral meatus on the right nearest the trigone was catheterized and the single meatus on the left also catheterized. The function on each side was moderately reduced. A bilateral pyelogram revealed apparently that the upper pelvis of each double kidney was filled. The evidence that we were dealing with a double kidney on each side was strengthened by the fact that the pelvis on each side was identical, the upper calyx of each was small and narrow and no calyx came off below the true pelvis. The patient did not return for further cystoscopy and the case was never finished. In this case we may have been dealing with an infection in one of the pelves of one of the duplicated kidneys. A recent letter of inquiry on this case remains unanswered.

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DISCUSSION (*Abstract*)

Dr. E. G. Ballenger, Atlanta, Ga.—Until the refinements of diagnosis made possible by cystoscopy came into use, the presence of ureteral anomalies were chiefly of anatomic interest. The persistence of pus in the urine without assignable cause should lead to a careful search for abnormal ureters. Well made pyelograms, ureterograms and uroselectan pictures will nearly always enable us to make correct diagnoses. The reason such conditions are not recognized more frequently is rather that we fail to suspect anomalies than that we are actually unable to demonstrate them.

Dr. Russell A. Hennessey, Memphis, Tenn.—Pathological conditions occurring in cases of duplication of the kidney pelvis and ureter often present difficult diagnostic problems. In the past few years we have seen 15 cases, 7 of which presented a variety of pathological renal conditions. Two of the cases were found in children, who presented symptoms of a persistent urinary tract infection. Nephrectomy was necessary in two other cases. Hemi-nephrectomy was contemplated in one because of calculus pyonephrosis, but nephrectomy proved to be necessary. The second case requiring nephrectomy was one of renal tuberculosis.

With the finding of a small retracted kidney pelvis, such as is found in atrophic pyelonephritis, it is often difficult to decide whether or not the small pelvis is one of a duplicated kidney. In this circumstance one often encounters some difficulty in proving the existence of a second kidney pelvis. The introduction of intravenous pyelography will unquestionably be of great value in determining the presence of some of the rather obscure renal anomalies.

Dr. Bransford Lewis, St. Louis, Mo.—If uroselectan is going to be of value, it will be in the revelation of a great many duplicated cases that would not be revealed by cystoscopy and catheterization.

Dr. Crowell says if we pull the cystoscope down a little farther and then make the pyelogram we shall get into the Y. We have no data how far to pull it down; the bifurcation may be so low down that we get into the bladder, and then it will be too late. Now, we have lately seen a case of carcinoma of the bladder in which the whole wall was involved, and we found it so difficult to get catheters in that we worked repeatedly before we succeeded, and then we took ureteropyelograms, showing some dilatation of the kidney pelvis and of the ureter, but no indication of duplication.

By using intravenous uroselectan we were able to demonstrate duplication of both ureters and both kidney pelves.

Dr. T. M. Davis, Greenville, S. C.—The chief reason why we fail to find these duplications, especially where they enter the bladder, is that the cystoscopist fails to look for them. He finds the usual two orifices and proceeds to pass catheters to the kidney without look-

ing for extraneous orifices. I have no doubt overlooked many, after I found one or two. I have always searched for them and have been rewarded by finding 24 to date.

Dr. I. W. Barrett, Memphis, Tenn.—At times we may have a constriction in duplicate ureters and we must dilate both to relieve the patient of pain.

Dr. Crowell (closing).—I had two objects in view in preparing this paper: first to emphasize the importance of a careful investigation to diagnose duplicate ureters and pelves; and second, to bring out what we have found in our work, that is, the facts that duplicate kidneys and ureters are much more prone to become diseased than the normal ureter and kidney.

I believe we should investigate carefully every case that comes under our observation for these anomalies. Dr. Lewis' plan of first filling the kidney pelvis with the radiographic fluid and then continuing to inject the fluid as the catheter is slowly withdrawn will often show up Y ureters and double ureters which would ordinarily be overlooked.

The dozen cases I am reporting are some of those that came to our Clinic. Our records show about as many more cases. One case came in just two days ago in which a Y ureter and double pelvis was discovered, but it has not been completely worked out yet.

FRACTURES IN THE ELBOW*

By W. B. CARRELL, M.D.,
Dallas, Texas.

Most physicians are familiar with what may be regarded as a fairly standardized method for treating fractures in the elbow, yet our results are not so good as in many other fractures, about which less is known regarding principles of treatment.

If one judges by the considerable number of deformities following elbow fractures, there is an apparent lack in appreciation of the relation of the bones in normal function, and less understanding of the mechanics of altered relations which affect function in the joint. The elbow joint is situated slightly in front of the long axis of the humerus in the adult and forward to a greater degree in children. Isidore Cohn has called attention to the value of accurate measurements for these changing positions, which serves to emphasize the importance of replacing the elbow in that relation required for the individual patient. In early life the joint is cartilaginous but at definite ages the various epiphyses appear and finally fuse, giving a different roentgenologic appearance during development. One should appreciate these anatomical variations in treating elbow injuries in children. It is unnecessary to keep an accurate chart because when films are made of the sound elbow for comparison every detail for the particular case is at hand.

Fig. 1 is the elbow of a boy 17 with a football injury to the elbow. Swelling and tenderness over the medial epicondyle suggested a fractured or slipped epiphysis. Comparison of the normal elbow in *Fig. 2* shows the fused epiphysis, and such distortion in growth on the injured side that a diagnosis can be made of slipped epiphysis years earlier, and a recent minor injury. In proof of the diagnosis, the boy was completely well and playing football in two weeks.

Slipped epiphysis in children may occur in conjunction with fractures and with dislocation. One should study carefully this possible element of injury in all examinations, and in doing so, make roentgenograms of the opposite elbow in the same position. A fractured epicondyle in the adult can be removed, when displaced widely, without serious impairment, but the loss of the epiphyses in children may result in arrested growth of the condyle and distortion in the carrying angle for the arm. Replacement is usually accomplished by direct manipulation of the fragment, assisted by flexing and extending the forearm. Fixation of the elbow in flexion should follow. Displacement of the medial epicondyle into the subluxated joint often produces ulnar nerve injury by dragging the nerve into a

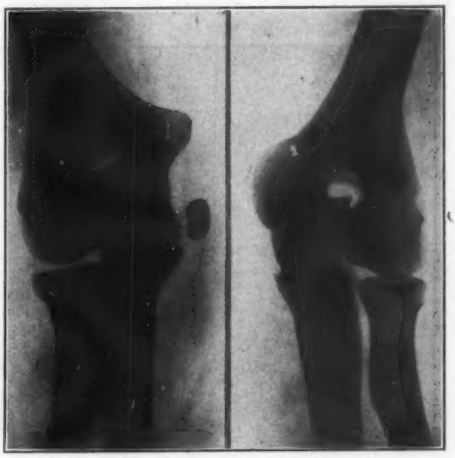

Fig. 1
Old slipped epiphysis.

Fig. 2
Same patient, normal elbow.

*Clinic, General Clinical Session, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

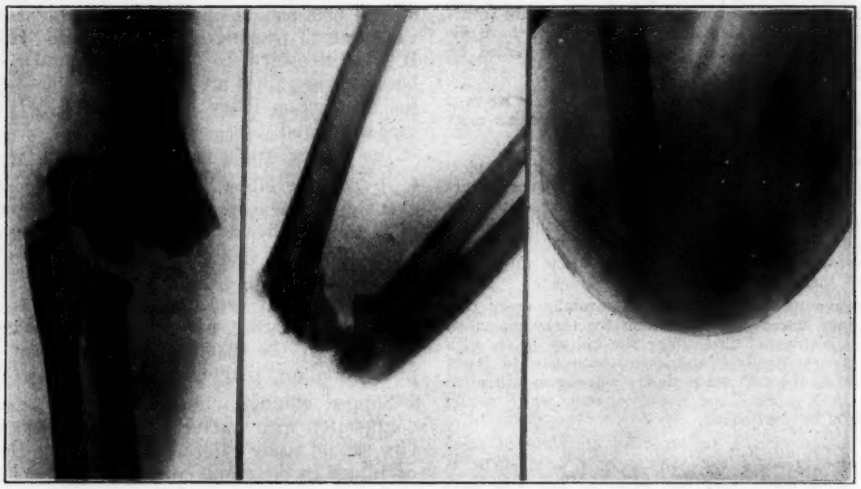

Fig. 3-A Fig. 3-B Fig. 3-C

A, Early reduction by manipulation. B, Over correction will distort carrying angle. C, Immediate change will correct anterior position of caput.

position where it becomes pinched when the dislocation is reduced. This complication was observed by Cotton several years ago, who advised removal of the fragment and freeing of the nerve.

Fracture of the lower end of the humerus, *Fig. 3,* may be through or above the condyles. Occurring generally in children, it may start anterior as a separation and extend upward and backward through the diaphysis as a fracture. Displacement of the lower fragment with the elbow and forearm is backward and upward (*Fig. 4*).

The diagnosis of fractured elbow is generally made by the patient, but the physician who wishes to avoid future trouble will make a careful but painless study of the injured arm, and enlighten the parents regarding his findings. As in all fractures, before the tissues become infiltrated with hemorrhage and muscle contraction adds to the difficulties, early examination should be made and reduction carried out. The soft tissue damage may exceed the bone injury. The patient who finds loss of motion or sensation after two or three days or perhaps only when the splints are removed, will be prone to blame the physician, when probably the damage was due directly to the injury and was not discovered. The detection of nerve injury is very simple

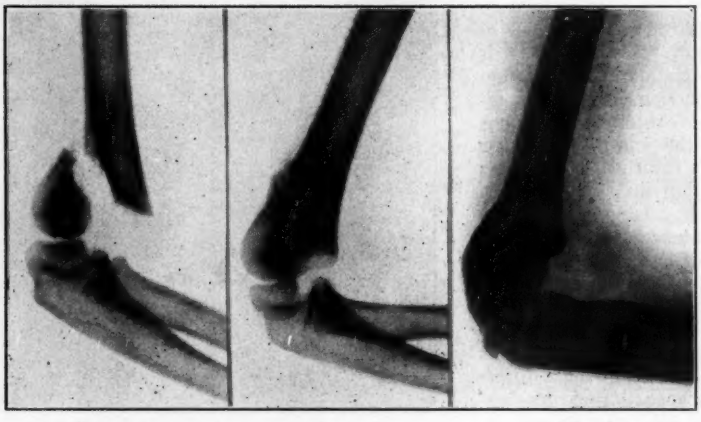

Fig. 4-A Fig. 4-B Fig. 4-C

A, Elbow deformity. B, Imperfect reduction. C, Union with faulty carrying angle, caput displaced backward.

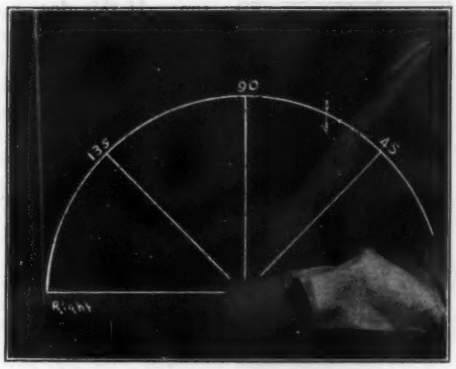

Fig. 4-D
D, Limited motion from bone block.

at first examination by a few tests of finger and hand action, involving the muscles under control of the three major nerves. If the patient has no sensory disturbance, and can flex and extend the hand and fingers, abduct and adduct the fingers, any nerve injury of consequence can be eliminated. On completion of the examination, which includes roentgenograms of the elbow in two planes and in many cases those of the other elbow, one is ready to reduce the fracture.

Reduction.—Complete relaxation is the first essential. A general anesthetic is given, or if one prefers, local infiltration of the hematoma between the fragments with 2 per cent novocain is most satisfactory. The forearm is extended *(Fig. 5)* and with one thumb against the lower fragment, the other hand makes traction while an assistant holds the shoulder and arm. The forearm is carried slowly into hyperextension, levering the fragment into anterior deformity, until the end engages, when slow steady flexion, the while maintaining traction, fixes the fragments into contact and normal alignment. In this acute flexion the forearm, pressing against the arm, is the anterior splint, and the triceps, taut and somewhat spreading over the condyles, make the posterior splint. *Fig. 6* shows the Jones position, and it appears that some have confused it with the full regime of reduction and fixation. A fracture above the condyle is not reduced by flexing the elbow, but after reduction acute flexion is the best position to hold it in. If there is resistance to full flexion, in the absence of considerable swelling of the soft parts, reduction has not been complete, and the manoeuvre should be repeated. Likewise, if there is only slight resistance, but the radial pulse is obliterated, reduction has not been well done. It is wise to carry the forearm snugly, without resistance, against the arm, then release 5 or 10 degrees and again test the radial pulse before final fixation. A pad or roll should not be placed at the bend of the elbow, but a flat piece of gauze will prevent chafing from skin contact.

Retention.—If the condyles are separately broken, the forearm must be held in supination or semipronation as necessary to relax the muscles arising from the particular epicondyle. In supracondylar fractures, however, it has not affected our results, whether the forearm be placed in supination or mid-pronation. The Lund swathe is the most comfortable dressing, is easily applied and suited to most cases.

After-Treatment.—Many elbows are put up properly, but seriously damaged by injudicious

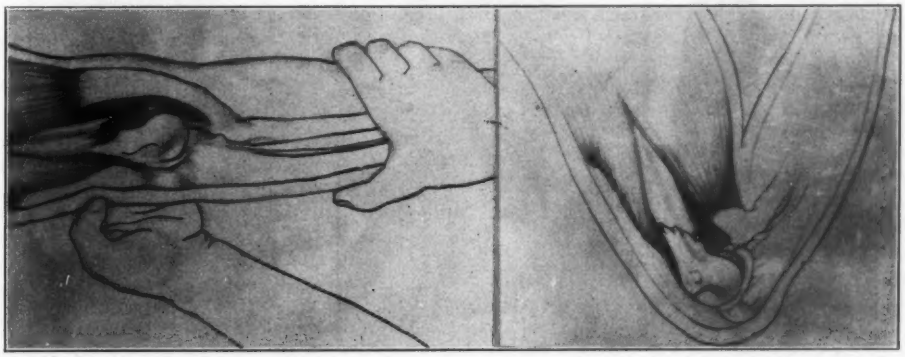

Fig. 5
Typical fracture lower end of humerus. Typical deformity practically corrected by hyperextension.

Fig. 6
Position of forearm for retention.

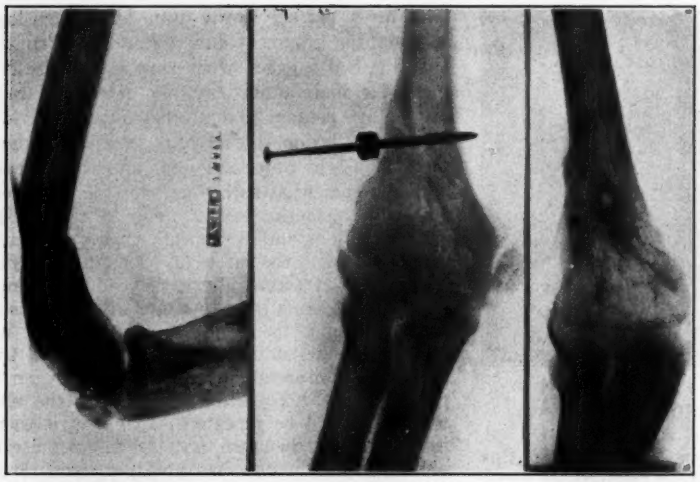

Fig. 7-A Fig. 7-B Fig. 7-C

A, Comminuted fracture extending into joint. B, Fixation with special screw. C, Same after eight weeks.

care in convalescence. The elbow should remain quiet during the early vascular changes in the soft tissue and at the bone ends. After ten to fourteen days light active motion may be started over a short range from the acute flexion. If this does not provoke increased soreness at the elbow, it may be increased in 48 hours, and continued until, at the end of three weeks, the forearm may be carried in a sling and should have reached a 90-degree position. The sling may be discarded in five or six weeks. Favorable cases will have a full range of motion in six to ten weeks, but under the same care others will have considerable limitation for a number of months.

Role of Physiotherapy in Elbow Fractures.—With the modern tendency to electrify our offices, there is a strong disposition to overdo physical therapy measures. These fractures, like all others, will be hastened in recovery of complete function by judicious use of heat, proper

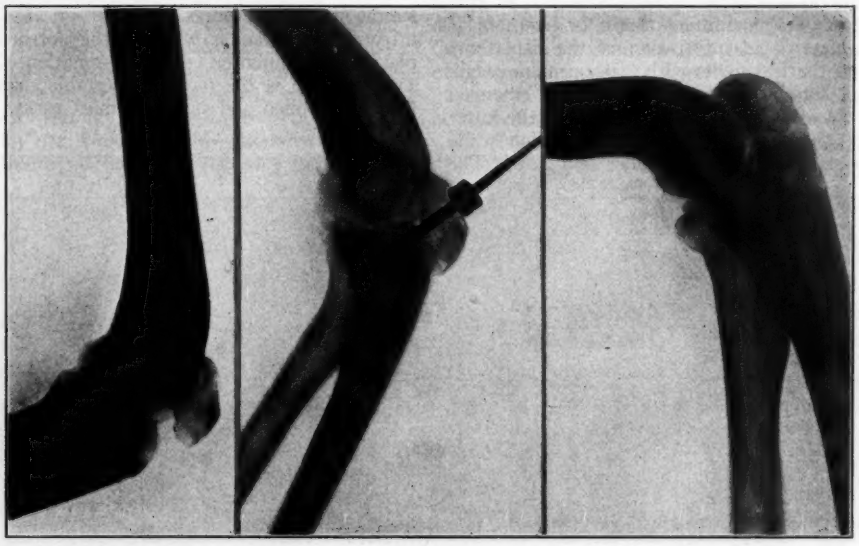

Fig. 8-A Fig. 8-B Fig. 8-C

A, Fresh fracture of olecranon with separation. B, Same held by special screw for two and one-half weeks. C, Same at six weeks. (Full range of motion at eight weeks.)

massage and directional active motion. The heat, by baking or other means, is only preliminary to a gentle, skillful massage, which promotes absorption of exudates and stimulates healing. Following this treatment active motions are increasingly carried out. At no time, with children, are passive movements carried beyond their active range, nor should they be subjected to manipulations under an anesthetic.

The very common supracondylar fracture and a routine treatment suitable for it has been presented with considerable detail, but most elbow cases come within this group and we make them difficult by failure to follow simple rules of treatment.

Extensively comminuted fractures involving the joint surface, and compound fractures, offer problems for surgical judgment, but in general, require some plan of bed treatment with suspension and traction. In certain comminuted joint fractures and those involving the olecranon we have devised a staple and a compression screw which have proven of definite value. These are described in a paper now in publication, under the title of "Internal Removable Devices in Fractures" (*Figs. 7* and *8*).

Any discussion of elbow fractures would be incomplete without reference to that serious and irreparable complication, Volkmann's contracture. Most of us have seen cases resulting directly from internal hemorrhage and pressure, where no splints were used, but the greater number are among those who did not get a good reduction, and flexion was obtained under great stress, cutting off the venous return with subsequent fibrosis in the muscles. The only satisfactory treatment is prevention. Reduce the fracture early, carefully and thoroughly, avoid too much flexion and watch the radial pulse. Do not hesitate to let the arm down, if there be undue swelling in fingers, pallor or cyanosis. Persistent pain after reduction of any fracture is indication for surgical observation. At a fracture clinic for Dr. Scudder in Dallas last year, we had seven boys under ten, standing in a row, exhibiting the deformity of Volkmann's contracture.

It was a lesson one cannot soon forget, and out of this experience this subject of fractures in the elbow has been discussed before you.

DIVERTICULA OF THE DUODENUM*

By J. T. McKinney, M.D.,
Roanoke, Va.

Diverticula occur throughout the intestinal tract from the pharynx to the rectum. The frequency of incidence is in the following order: colon, ileum, esophagus, pharynx, duodenum and stomach. In this paper the discussion will be limited to diverticula of the duodenum.

James T. Case, in 1913, was the first to publish a report of diverticula of the duodenum, diagnosed in the living subject by the x-ray. In 1915, Forsell and Key reported a case diagnosed by x-ray studies and successfully operated upon. Since then numerous excellent articles with reports of cases have appeared. In a survey of reported cases, the condition is found on an average in about 1 to 2.5 per cent of cases studied by means of the x-ray. Rogers, in the *British Journal of Surgery*, April, 1930, reviews from the literature 23 cases of primary diverticula which had been operated upon. Of this number, 19 were women and 2 men. In the remaining two cases the sex was not given.

For purposes of classification, diverticula may be divided into two general types: the primary or congenital, and the secondary or acquired. By far the larger proportion of cases is of the congenital or primary type. The secondary or acquired type may be produced by adhesions from duodenal ulcers, diseased gall-bladder, pancreas, or pathological lesions in near-by viscera. A few cases must be differentiated from dilatation of the ampulla of Vater.

Primary diverticula are found in the second, third, and fourth portions of the duodenum, but by far the larger number are seen in the second portion. Practically all cases show the sac on the concave portion of the duodenum. They may be in front of the pancreas and covered by peritoneum, behind the pancreas in the retroperitoneal space or in the substance of the head of the pancreas. While usually single, they may be multiple, a number of cases having been reported with several pouches.

The secondary or acquired type is commonly found associated with concurrent lesions in the

*Read in Section on Radiology, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

gall-bladder, pancreas or duodenal bulb. They occur with few exceptions in the first portion of the duodenum and have as a rule a complete muscular coat. Often they are due to duodenal ulcer with adhesions, or may be indirectly due to redundancy and pouching of the duodenum opposite an ulcer, which is usually on the superior border. As the pathology of these secondary diverticula is that of the disease that causes them, they of themselves rarely give symptoms, and the original condition must be corrected.

Many theories have been given as to the cause of formation of primary diverticula, namely, intra-duodenal pressure and chronic obstruction. There is greater pressure in the duodenum than in the jejunum or ileum, because the pylorus opposes reflux, and chronic obstruction occurs as a sequel to visceroptosis and weak spots in the bowel wall. Klebs thinks that there is a relation between the points of entrance and exit of the blood vessels and sites of origin of the diverticula. The mucosal pouch, or hernia, occurs along the path of the perivenous connective tissue sheath. Heidecker considers that portal venous stasis causes a distention of the veins. When this stasis diminishes, potential spaces will be left in the bowel wall which had been filled by the congested vessels.

The diverticula may be round, flask or sac-shaped protrusions of the mucous and submucous coats of the bowel through the muscular coats. They usually communicate with the bowel by a constricted neck, though a few broad, flat diverticula have been reported. They vary in size from 1 cm. to 5 cm. in depth and look somewhat like toy balloons.

No case has ever been diagnosed prior to operation or autopsy except by x-ray examination. The condition is found more commonly in women past the middle age of life. The patient should be given an opaque meal and fluoroscoped in both the standing and prone positions, turned on the right side, and pressure should be made over the duodeno-jejunal junction. The pouch or diverticular sac, if found, should be studied at frequent intervals to determine the size, shape and position of the pouch, and the length of time the barium is retained. True diverticula are persistent and usually mobile. Normally the duodenum is completely empty in four hours.

There are no definite clinical symptoms which are pathognomonic of these diverticula. There may be a feeling of heaviness and distention after food. Heartburn, sour stomach and a feeling of nausea are frequently present, though vomiting is rare. Some cases closely simulate chronic cholecystitis, pancreatitis, peptic ulcer and colitis, complaining of pain, vomiting and hematemesis. Pain may vary from a slight ache to severe colicky pains, and is one of the commonest symptoms. The pain may recur at irregular intervals and is frequently relieved by food and alkalies. Loss of weight and appetite is common.

The differential diagnosis is usually not difficult. Calcified glands, gallstones, renal calculi, fecoliths, bismuth in the colon or barium in the crater of a duodenal ulcer may occasionally be mistaken for a diverticulum, but if careful fluoroscopic studies are made, filling the duodenum in doubtful cases through a duodenal tube, the presence or absence of true diverticula should not be hard to determine. It is also important in some cases to make the Graham-Cole dye test of the gall-bladder.

The great majority of diverticula give no symptoms, there being a comparative immunity from inflammation, due to the sterility of the duodenal content and to their retroperitoneal location. However, there may be a peri-diverticulitis with adhesions. The pouch becomes septic and causes a duodenitis. Retention of food or foreign bodies, inflammation of the sac, or distention of the sac are the usual causes of symptoms.

Treatment, when it can be determined that the diverticula are giving symptoms, consists either in surgical removal with excision of the diverticula, or in handling the case upon general lines used for duodenal ulcer. It is important to keep the bowels well lubricated with mineral oil. X-ray studies are of great help in determining whether diverticula should be operated upon, for a pouch that empties itself easily is hardly likely to be causing symptoms. At times it is difficult to locate the diverticulum at operation, particularly if it lies behind the pancreas or is buried in the gland.

The following two cases of primary diverticula briefly reported are illustrative of the clinical course and symptoms usually encountered:

Case 1.—Mrs. A. E. G., age 55, a housewife, complained chiefly of indigestion, vomiting and sick head-

Fig. 1
Case 1. Diverticulum, concave side, second portion of duodenum.

Fig. 2
Case 1. Barium remaining in diverticulum at end of thirty-six hours.

ache. The onset of symptoms dated back about three years. There was marked accumulation of gas in the intestines. The patient became nauseated and vomited a large amount of black fluid, followed by passage of tarry stools. She became unconscious that night and continued to pass tarry stools for about ten days or more before calling a physician. At the end of that time her physician was consulted and she was put to bed for five weeks. She improved and felt well for about six months, when she began having severe headaches and some digestive disturbance. She was in California at the time. Following an x-ray examination, she was told that she had a duodenal ulcer. She rapidly lost weight, but did not pass tarry stools. Her joints began to get stiff and she developed an arthritis, which incapacitated her to such an extent that she could hardly get about. Her teeth were extracted and she felt better and gained some weight. Since then she has felt fairly well except for some slight burning and indigestion before eating. Following the ingestion of food there was considerable formation of gas, but no marked pain. The gas would last for several hours and there was a lot of eructation early in the morning. Soda relieved the gas formation to some extent.

An x-ray study made June 7, 1928, showed a small, round diverticulum about 1.5 cm. in diameter filled with barium and projecting from the lumen of the second portion of the duodenum towards the head of the pancreas. Barium remained in this sac or diverticulum at the end of 24 and 36 hours. Definite tenderness was noted over the diverticulum.

The digestive symptoms continued with no marked improvement following medical treatment. This patient consented to operation and on February 22, 1930, she was operated upon by Dr. E. C. Ambler at the Roanoke Hospital. The duodenal bulb and stomach were normal in appearance and showed no evidence of an ulcer. The bulb was mobilized on the right side and closed without revealing the diverticulum. However, after an exposure through the mesocolon was made, the diverticulum was found in the second portion of the duodenum. It had a sessile base and was about 1.5 cm. in length and 0.5 cm. in depth. A pathological appendix was also removed. The patient made an uneventful recovery and was discharged from the Hospital March 10, 1930. She has steadily improved and is in good health at the present time and free from digestive symptoms.

Case 2.—P. C., age 48, a woman, complained chiefly of a dull pain in the epigastrium. The present attack had lasted most of the previous three weeks. Pain was worse from 4 to 5 o'clock in the afternoon, or about two hours after eating. She was sometimes relieved by food, but was occasionally made worse by eating. She knew of no particular foods that increased her pain. The pain did not radiate. She had a great deal of gas after meals. There was no nausea nor vomiting. The attacks had been coming on at various times for over seven years, lasting various lengths of time. There was an extremely severe pain in the epigastrium with one attack.

X-ray examinations made by Dr. J. F. Armentrout and myself for Dr. W. R. Whitman at the Lewis-Gale Hospital, April 21, 1930, showed a definite pouch or diverticulum about 1.5 cm. in width protruding from the second portion of the duodenum on the concave side. The diverticulum was filled with barium at the end of 48 hours and definite tenderness was elicited over this area upon deep palpation. The Graham-Cole

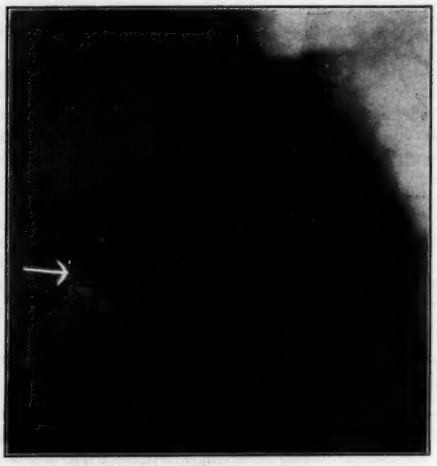

Fig. 3
Case 2. Diverticulum second portion of duodenum.

Fig. 4
Diverticulum or pouch of duodenal bulb due to adhesions, chronic cholecystitis.

dye test was also made, showing some disturbance of gall-bladder function. This patient was given medical treatment and showed some improvement, but is not symptom free. She has been advised that operative interference may become necessary if her symptoms continue.

SUMMARY

(1) Diverticula of the duodenum occur in about 1 to 2.5 per cent of cases studied by means of the x-ray, the greater number being found in the second portion.

(2) They may be divided into two general types, primary or congenital, and secondary or acquired.

(3) Roentgen ray examination furnishes the only conclusive, positive means of making a diagnosis of diverticula before operation or autopsy.

(4) No definite clinical symptoms are pathognomonic, patients exhibiting symptoms of duodenal ulcer, chronic cholecystitis, pancreatitis and colitis.

(5) X-ray studies are of invaluable help in determining if diverticula have developed a diverticulitis.

(6) Treatment of diverticula is by surgical removal or excision.

(7) Two cases are reported, one with successful removal of diverticulum, the other with improvement under medical treatment.

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DISCUSSION (*Abstract*)

Dr. H. E. Ashbury, Baltimore, Md.—The earliest record of a case of diverticulum of the duodenum that I could find was in 1710. Buschi later collected 54 cases. Spriggs and Marxer reported 38 cases in 1,000 x-ray examinations, so their incidence was a little greater than Dr. McKinney's. Their cases were distributed equally between men and women, although most authorities state that they are most frequently seen in women. Duodenal diverticula are false, as they

do not contain all of the coats of the bowel. The mucosa and submucosa are present, but the muscular coats are absent. They are in fact herniations through the muscular coat. The theory that they are congenital, enlarging and producing symptoms late in life is supported by the facts that they have been demonstrated, first, in the embryo; second, in very young children in association with diverticula in other organs; and that they occur in the region of the ampulla of Vater, where the pancreatic ducts are developed from duodenal buds. The theory that they are acquired is supported by the facts that they nearly always occur in the mesentery side of the duodenum, where the muscular wall is weakened by the passage of vessels; that they seem to appear to produce symptoms late in life and that they have been formed experimentally by distending the bowel with water. The so-called traction diverticula due to adhesions resulting from ulcer or gall-bladder disease are most frequent in the first portion of the duodenum. The pathological changes that may occur in diverticula are similar to those occurring elsewhere in the digestive tract, namely, acute and chronic inflammation and perforation and secondary changes in the pancreas or the liver. Carcinoma is rare. As a rule they do not produce symptoms and are only detected during routine x-ray examinations. The differential diagnosis is usually not difficult from penerating ulcer or the ampulla of Vater. Perforating ulcers usually contain air, which is a dangerous sign. Operation is advisable if the symptoms can be traced to diverticula. The approach is easy if they arise from the anterior surface of the duodenum, but when they arise from the posterior surface they are difficult to find at operation. The operation of choice is excision.

The impression that is more or less general appears to be that duodenal diverticula are of very little pathological importance and I must confess that until hearing Dr. McKinney's paper I felt the same way. When a diverticulum was encountered during an x-ray examination it was reported, but no pathological significance was attached to its presence.

The roentgenologist should endeavor to determine whether the diverticulum is painful to pressure, and if it does not empty promptly, the fact should be reported.

Dr. J. C. Dickinson, Tampa, Fla.—One of my patients, a woman about fifty, well nourished with indefinite digestive symptoms, after an opaque meal showed a large diverticulum on the lesser curvature side of the second portion of the duodenum. This diverticulum retained the meal at least seventy-two hours. Some time later the patient was given gall-bladder dye in capsules. When she came in for the gall-bladder examination, the capsules, partially broken up, could be seen trapped in the diverticulum.

Dr. C. H. Heacock, Memphis, Tenn.—When we find a diverticulum we should not make too big an effort to impress that fact upon the mind of the patient and the referring physician. Diverticula may produce symptoms in at least two ways: (1) by becoming the seat of an inflammatory process (diverticulitis), or (2) by producing obstruction due to the pressure of the filled sac upon the adjacent lumen. The two most reliable roentgen signs of the presence of a diverticulitis are localized tenderness and spasm.

The important things to remember are to examine the entire duodenum and to recognize but not overemphasize the importance of diverticula.

Dr. H. S. Shoulders, Nashville, Tenn.—In one of my patients a large diverticulum in the first portion of the duodenum was found, and what we thought was a penetrating ulcer. In addition, this man had sugar in the urine. At operation, the ulcer was found to penetrate into the pancreas. After the diverticulum was removed and the ulcer closed, the sugar disappeared and he has remained sugar-free since.

Dr. D. A. Rhinehart, Little Rock, Ark.—I should like to ask Dr. McKinney whether it has been his experience or whether he has found in the literature a mention of other congenital abnormalities associated with duodenal diverticula? Recently I observed a patient with three duodenal diverticula associated with an unusual arrangement of the small and large intestines. The cecum was behind the navel, the ascending colon arching upward and to the right under the liver, the hepatic flexure forming an acute angle. The usual duodenal loop was absent, the duodenum joining the jejunum in the right side of the abdomen. Just distal to the cap was a posterior diverticulum 1 cm. in diameter. The duodenal ampulla was dilated to a diameter of 1.5 cm., forming the second diverticulum. The third and largest diverticulum, about 3 cm. in diameter, was situated about 5 cm. below the ampulla. There was an associated gall-bladder infection and duodenal ulcer.

Dr. McKinney (closing).—I have never seen a case like the one described by Dr. Rhinehart.

FOREIGN BODIES IN THE FOOD AND AIR PASSAGES*

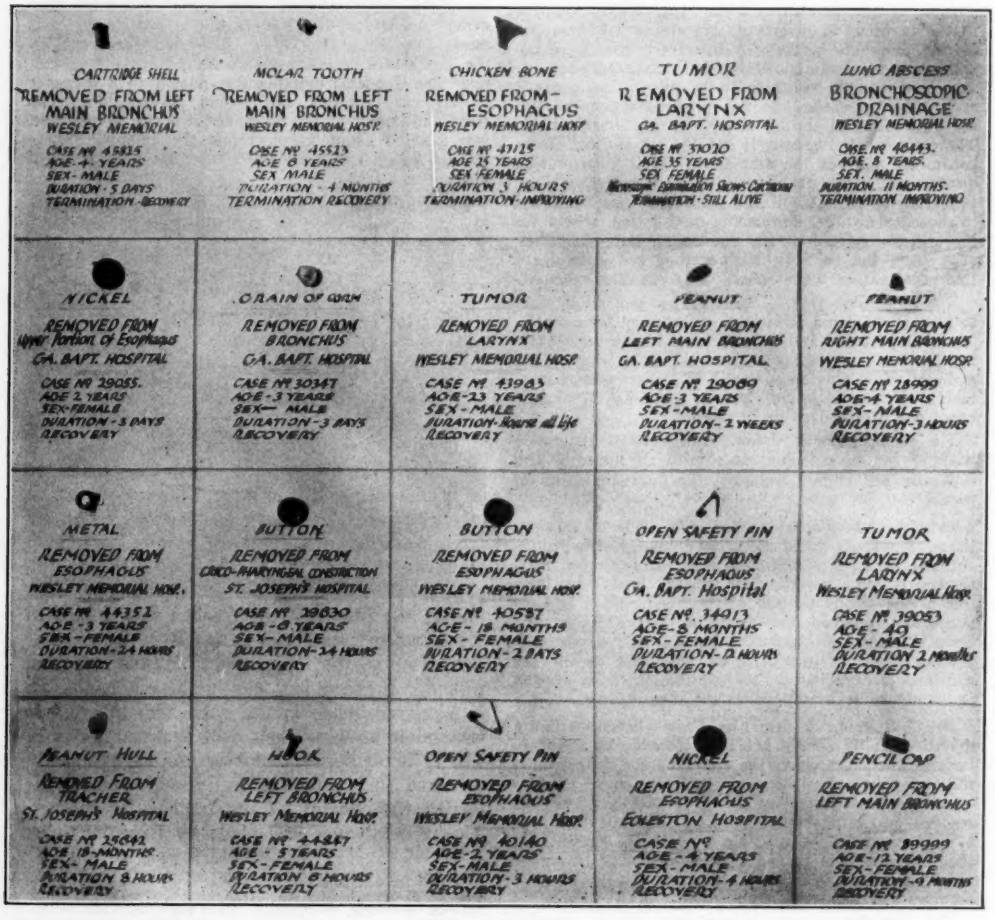
By MURDOCK EQUEN, M.D.,
Atlanta, Ga.

The removal of foreign bodies from the food and air passages by means of the esophagoscope or bronchoscope is now a well recognized surgical procedure. The early methods of removing foreign bodies from the lung required tracheotomy: the foot of the bed was elevated in the hope that the object would be coughed up. This failing, the lumen of the trachea was tickled in the effort to create violent expulsive forces that would force the object out of the tracheal wound. If the object was in the esophagus, an incision was made in the neck and an attempt was made to remove it with curved forceps. The difficult approach to the esophagus usually rendered such attempts futile, and success attended the opening of the trachea far oftener. The next advance was made by Bruening, who

*Read in Section on Ophthalmology and Otolaryngology, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

passed a bronchoscope through the tracheotomy wound: this enabled him to reach far down in the tracheobronchial tree. This procedure also was followed by a high incidence of failure and pneumonia, and it was often necessary to leave a tracheotomy tube in place. Bruening's method was improved by the introduction of a much smaller bronchoscope that could be passed through the larynx when the head was extended backward: tracheotomy was thus rendered unnecessary. Further improvement was made when the light was moved from the upper to the lower end of the scope, close to the part to be examined or the object to be removed.

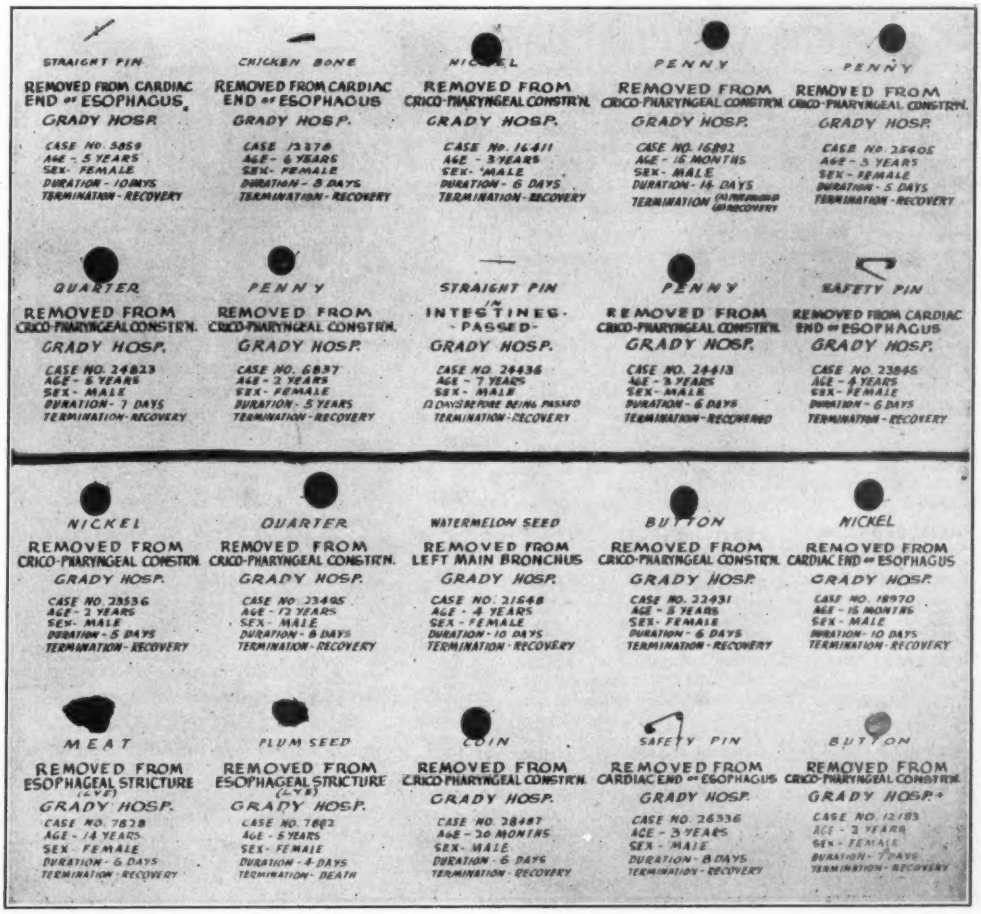
Chevalier Jackson, of Philadelphia, has done more to improve the technic of endoscopy and to popularize the operation than any other man. His book on the subject should be in the hands of every rhinolaryngologist, and should be available to every physician. This work has been consulted freely in the preparation of this article. Dr. Jackson's reputation is, of course, world wide. Robert C. Lynch, of New Orleans, although not so well known, has also accomplished a great deal in this work. Dr. Lynch has evolved an ingenious apparatus to suspend the patient in mid-air, which makes it unnecessary to hold him in position by the old strong-arm method. This apparatus includes means of holding the scope in place so that the surgeon



has both hands free for instrumentation. This is particularly valuable in prolonged operations upon the larynx. Recently I had the privilege of spending several days at Dr. Lynch's clinic and, although his methods may appear deceptively easy in his own skilled hands, I feel sure that they mark a distinct advance in bronchoscopy. I should like to thank Dr. Lynch for his courtesies now, and to express publicly my appreciation of the splendid work he is doing.

Foreign bodies are usually seen in the two extremes of life, that is, in early childhood before the teeth have appeared, and in old age when the teeth have been lost. There is no doubt that during the act of mastication we are able to detect foreign bodies with our teeth and thus remove them. Objects frequently slip by artificial teeth, however, on account of the absence of nerve sensation in them.

Generally speaking, foreign bodies may be divided into two main classes, metallic and non-metallic, or inorganic and organic. To the first class, metallic objects, the lung substance is most tolerant. Such objects have been present for years before producing marked pathologic changes. The lung is far more aggressive to objects of the non-metallic or vegetable class, and rapidly develops pneumonia and subsequent abscess in their presence. Jackson has noted the condition so frequently following the aspiration



of vegetable matter that he terms it "vegetable tracheobronchitis." Peanuts are the most irritating of all vegetable substances. Roasting brings out the oil in the nut and makes it even more irritating.

In the diagnosis of a foreign body, a most careful history should be taken to elicit the occurrence of choking, gagging, cyanosis, wheezing respiration, pain, fever, cough, dyspnea, difficulty or pain in swallowing, or regurgitation at the time of the accident. Frequently a history is unobtainable on account of the age of the child and the absence of an older person at the time he aspirated or swallowed the object. In such cases one has to depend entirely on signs and symptoms. Foreign bodies in the larynx usually produce a wheezing type of respiration which is peculiar to the larynx and can be localized there. If a large object is present, either in the larynx or the trachea, there is usually accompanying dyspnea, with indrawing of the suprasternal notch, supraclavicular fossas, intercostal spaces and lower sternum. When an object is in the bronchial tree, symptoms depend largely on its position. A metallic object may present only those of an obstructive emphysema, but a peanut would cause marked bronchitis extending beyond the obstructed area. Roentgenograms should always be made, as they aid in the rapid diagnosis of metallic objects. The

plates in cases of organic matter must be more carefully studied to determine the position of the diaphragm and the presence of obstructive emphysema. The symptoms of a foreign body in the esophagus are usually those of swallowing and coughing when the object is sufficiently large to cause pressure on the larynx. When the foreign body has been present a long time and has caused perforation of the cervical part of the esophagus, there will be subcutaneous emphysema and cellulitis, with accompanying pneumonia from the overflow of fluids into the trachea.

Foreign bodies in the intestines usually, but not always, pass out without doing any harm. If opaque to the roentgen ray, they should be watched until they have been expelled. When an open safety pin is seen in the intestine and remains stationary for four days, it is best to perform a laparotomy and to close the pin gently without opening the intestine. Emetics and purges should not be given, as either may cause a sharp foreign body to perforate and so kill the patient.

There is no treatment for foreign bodies in the esophagus or tracheobronchial tree except early removal by means of endoscopy. Attempts at digital removal are wrong, as frequently objects high up in the pharynx are shoved down, either into the larynx or the esophagus. Slapping a child on his back or swinging him by his feet may cause violent inspiration to carry far down into the bronchial tree a foreign body that was originally high up, or the object may be caught by the vocal cords, causing sudden asphyxiation.

When a history of swallowing or aspirating a foreign body is given, the patient should never be considered well until the foreign body is coughed up, removed endoscopically or passed in the stools.

Before closing, the aspiration of foreign bodies is fortunately infrequent, but other uses for the bronchoscope have been found. At the meeting of the American Bronchoscopic Society in Atlantic City last March, the papers impressed upon me the recent advances in this field. The removal of foreign bodies, it seems, has already become of secondary importance, and endoscopy is now more frequently employed in the diagnosis and treatment of pathological conditions of the esophagus and of the larynx.

1207-13 Medical Arts Building

DISCUSSION (*Abstract*)

Dr. E. G. Gill, Roanoke, Va.—I shall confine my remarks to the indications for the removal of foreign bodies from air passages by lower or tracheal bronchoscopy.

Jackson states that tracheotomy may be necessary for relief of dyspnea, but not for the removal of a foreign body. Of course, he is giving his own experience, and in his hands the impossible has been made possible. In our experience with 100 foreign bodies we have found tracheotomy necessary for removal of foreign bodies in two cases. The advantages of tracheal bronchoscopy are as follows:

First, a larger tube can be introduced through the trachea than the larynx, thus giving a better view and more dilatation of the bronchi, which is very helpful in creating forceps space.

Second, large, irregular foreign bodies require tracheal bronchoscopy, where a secure grasp is impossible, and they are likely to be stripped off by the vocal cords, resulting in sudden death from asphyxiation.

Third, children under two years of age with organic foreign bodies complicated by tracheobronchitis will require tracheotomy for relief of dyspnea in at least 50 per cent of all cases, even though the foreign body has been successfully removed by bronchoscopy. The glottis is swollen and bronchoscopy increases the swelling. In this particular type of case I feel that bronschoscopy should be preceded by a tracheotomy.

Tracheal bronchoscopy is indicated in a very limited number of cases.

Dr. Reese W. Patterson, Knoxville, Tenn.—Anyone doing this work is profoundly impressed with the number of little pieces of peanut, watermelon seeds, and what not that get down into the lung and the carelessness with which the average parent will permit a child to play with such things. Only last week a little child was brought in, three years of age, with a watermelon seed in the right lung and the lung completely closed. The child had been given watermelon and it had vomited something like a handful of seeds. Jackson has enunciated the dictum that no child under four years of age should be given any kind of nuts unless they are ground. I think it is high time to sound a note of warning and emphasize the danger of peanuts, watermelon seeds and foreign bodies of that type.

I should like to ask the Doctor about the anesthetic. I had the pleasure of working two years with Dr. Chevalier Jackson and watching his uncanny, marvellous skill in handling these cases, but I have never been able to do this work as well with no anesthesia. Of course if one has a tracheal foreign body and the child is struggling for breath, we cannot think of giving an anesthetic, but where one lung is so that he can breathe, I have removed the foreign body much more successfully and with much less shock under anesthesia. I think anyone doing this work is playing a lone hand. Usually in the smaller cities there is only one man who undertakes it, and we often wonder whether others are making as many failures as we are.

Dr. C. H. Krieger, Louisville, Ky.—While working under Dr. Jackson I was taught not to use general anesthesia. In children possibly we might administer one-eighth to one-sixth grain of morphine hypodermically for esophageal foreign bodies, even as high

as a quarter grain in children three years old. For foreign bodies in the trachea and bronchus, my practice has been to use no anesthesia at all in children. With adults I use an application or spray of 2.5 per cent cocaine and then use the Jackson forceps applicator and anesthetize the sinuses.

In using the retrograde method of esophageal bougienage, too much pull must not be put on the soft rubber bougie as it is brought up through the esophagus. At present I have a case similar to these under treatment at the Children's Hospital here, and I always put some traction at the lower end of the soft rubber Tucker bougie to lessen the diameter.

With foreign bodies in the stomach, Dr. Jackson in general holds that if the patient is kept under observation they usually pass. I have seen needles pass after twelve to forty-eight hours, and find their way out through the intestines.

Esophagoscopy is a diagnostic procedure that should be used oftener. In the past year we have had three cases at the City Hospital here, patients who came in complaining of dysphagia or some uncomfortable feeling in the throat. Repeated x-ray examination revealed nothing abnormal, Finally they were sent to me and esophagoscopy revealed carcinoma. This is a procedure to which little risk is attached, and I think we should bear in mind Dr. Jackson's dictum, "Look and see!"

We should make it a rule to have an x-ray picture not longer than two hours before esophagoscopy or bronchoscopy is done. Foreign bodies change position frequently. And we should insist upon having two plates, antero-posterior and lateral. In Dr. Jackson's Clinic I saw a case from the Veterans' Hospital with a diagnosis of abscess of the lungs due to foreign body. He had an anterior-posterior x-ray accompanying his history, which showed a finishing nail just under the right scapula. When he was taken to the x-ray room and a lateral view was taken it showed this nail embedded in the muscles under the shoulder blade. His lung abscess was due to being gassed during the War.

Dr. Louis Daily, Houston, Tex.—In case of an abscess following the removal of a foreign body, the possibility of another foreign body in the lungs should not be lost sight of. Recently I was called to remove a paper clip from a child 3 years old, which showed on a roentgenogram. In place of the paper clip I removed from the right main stem bronchus, low down, a long wooden bead, with a large lumen. I reintroduced the tube and found the paper clip. The parents recalled that the child played with paper clips 6 months previously, but did not suspect that he aspirated any. Three months later they thought that he aspirated a wooden bead. Three months later he developed fever and a cough; then an x-ray photograph was taken which showed the paper clip, but not the wooden bead. Had the paper clip been aspirated last and the wooden bead first, we should have removed the clip and left the bead behind. The child might have died of pneumonia or of an abscess of the lungs.

Dr. Equen (closing).—A foreign body goes down one way and you should be able to bring it out the same way it goes down. I wonder if Dr. Gill could have removed the foreign bodies he mentioned without opening the trachea had he obtained complete relaxation from a general anesthetic. In regard to safety pins, I have found that the point of the pin is the dangerous part, and once this point is within the scope one has little to fear from the trauma produced by the other end.

There are two schools regarding anesthesia in the removal of foreign bodies. Dr. Lynch, of New Orleans, always gives a general anesthetic and recently stated in his clinic that he had never had any bad effects, such as pneumonia or lung abscess, except in cases in which a pneumonic process was already present at the time of operation. One easily realizes that there is less struggling with its resultant edema under a general anesthetic than under a local one, regardless of how well the child is pinned in a sheet and how firmly held. The other school, following Dr. Jackson, believes all foreign body work should be done under a local anesthetic. For the removal of the secretions of lung abscess or bronchiectasis, local anesthesia is the only method to be considered. We recently used sodium amytal for esophagoscopy on a cardionephritic patient who had swallowed a chicken bone. His blood pressure was over 200. The bone swallowed, according to the roentgenogram, appeared at the crico-pharyngeal constriction. He was given 6 c. c. of sodium amytal intravenously and the esophagoscope was introduced. Much to my surprise, the bone was not present at the location shown by the roentgenogram, but the passage of the esophagoscope was continued and the bone was found just at the entrance of the stomach. This gives you an idea of the complete relaxation which follows the administration of this drug. This is the only time we have used it intravenously, but have found it a most excellent aid in bronchoscopic work when given by mouth, which we consider the safer method. I recently had a child of 2½ years with a grain of corn in the right bronchus, which was removed without any difficulty under this drug.

There is no form of surgery which requires more rapid work than bronchoscopy. The idea is to get in and get out in the least possible time with the least trauma. Those who tarry within the lung subject themselves to complications: pneumonia and edema of the larynx with its subsequent tracheotomy.

CONGENITAL TRACHEOESOPHAGEAL FISTULA: CASE REPORT*

By V. K. HART, M.D.,
Charlotte, N. C.

The patient, a white male child, one day of age, was first seen with Dr. Oren Moore and Dr. Robert A. Moore on April 15, 1931, because of inability to swallow and choking attacks after nursing. An obstruction in the esophagus had already been demonstrated by catheter and barium roentgenogram.

I did an immediate esophagoscopy with no anesthesia, finding a high, imperforate esophagus. The child, of course, died despite a palli-

*Received for publication June 26, 1931.

*From the Charlotte Eye, Ear and Throat Hospital.

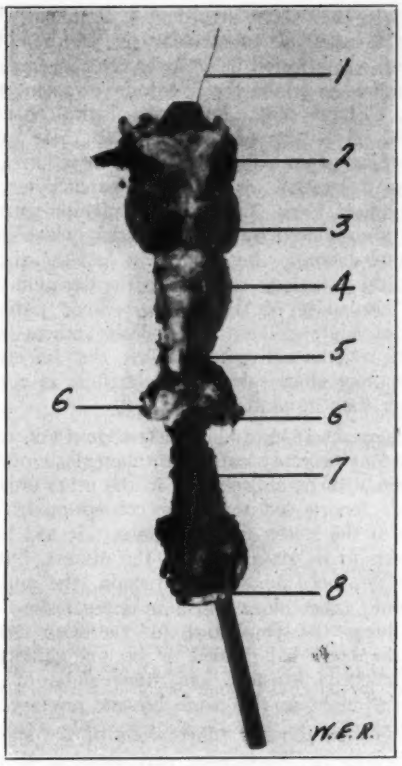


Fig. 1

Gross specimen of tracheoesophageal fistula. (1) Probe thrcugh cardia, lower esophageal segment, trachea and emerging from larynx. (2) Thyroid cartilage of larynx. (3) Thyroid gland. (4) Upper esophageal segment ending in blind pouch. (5) Cord connecting upper and lower esophageal segments. (6) Main stem bronchus. (7) Lower esophageal segment directly continuous with trachea above bifurcation. (8) Cardia.

ative gastrostomy. The autopsy specimen is reproduced.

DISCUSSION

Study of the specimen at once shows why the stomach was ballooned with air at gastrostomy and why subsequent feedings via the gastrostomy tube caused the child to cough up milk.

Standard text books gave this matter but passing mention. However, an excellent review of the whole subject is given by Phelps.[1] His classification of esophagotracheal fistula is as follows:

(F) Esophagotracheal fistula (malformation of esophagotracheal septum)
  (1) Esophagus and trachea normal, except for fistula
  (2) Esophagus in two segments
    (A) Upper segment
      (1) Orifice normal
      (2) Lower end atresia

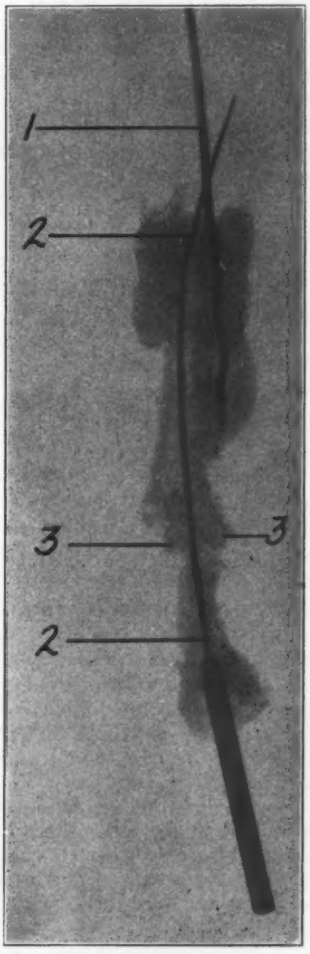


Fig. 2

Roentgenograms with probes in situ. (1) Probe in upper esophageal segment which ends in blind pouch well above bifurcation. (2) Probe through cardia, lower esophageal segment, trachea, and larynx. (3) Main stem bronchus.

1. Phelps, Kenneth A.: Congenital Anomalies of the Esophagus with a Report of Nine Cases. Ann. Otol., Rhin. & Laryng., 39:364, June, 1930.

(a) Connected to stomach or lower esophageal segment by solid cord
(b) No connection to stomach or lower esophagus
(c) Fistula into trachea

(B) Lower segment
(1) Upper end has fistula into trachea or bronchus
(2) Lower end opens normally into stomach

His bibliography includes the foreign literature and gives apparently 132 recorded cases of this type, to which he adds four.

Embryologically, of course, there is incomplete closure of the esophagotracheal septum, and probably also maldevelopment of this structure to give the upper blind sac.

We have seen one other case in this Clinic exactly of the same type as that reported. No such case has ever been successfully handled surgically, either technically or as to ultimate survival.

PRIMARY TUBERCULOSIS OF THE SPLEEN, WITH REPORT OF A CASE SIMULATING BANTI'S DISEASE*

By GEORGE BUNCH, M.D.,
Columbia, S. C.

Since Winternitz, in 1912, reported from the literature a detailed study of 51 cases of primary tuberculosis of the spleen only individual case reports of it have been found. These, if included in his list, would in no material way affect his findings. His classification of splenic tuberculosis into primary and secondary types is at first confusing; for, strictly speaking, there can be no such thing as primary tuberculosis of the spleen. Primary, according to him, is a tuberculous infection remaining in the spleen after the original focus or portal of entry in some other part of the body has healed. Such a spleen may itself become a disseminating focus. Secondary, on the other hand, is the involvement of the spleen from an unhealed infecting or primary focus, and it is often but a part of a generalized tuberculosis.

Secondary tuberculosis of the spleen is common, especially in childhood and adolescence. The statistics of the University of Kiel from 1873 to 1889 show, according to Reinhold, that in 428 cases of tuberculosis in children the spleen was affected in 66.7 per cent, whereas of 836 cases in adults the splenic involvement was only 19.1 per cent. Early pathological changes found on section of the spleen in these cases are those of an acute generalized infection with acute congestion and granular parenchyma as in typhoid fever. Later the Malpighian corpuscles are replaced by large tubercles, which may become caseous. Both the gross and the microscopical pathology varies with the duration and the chronicity of the disease. Some patients die of acute miliary tuberculosis; others with more resistance live to localize the infection. The tuberculous spleen in children is as a rule larger than in adults.

Coley, in 1846, and Monerret, in 1859, each found at necropsy extensive tuberculosis of the spleen with no tuberculosis in the other organs. Their reports led to a new conception of the role of the spleen in tuberculosis. It had been known to be susceptible to the disease, but it had not been known to remain the site of chronic tuberculous infection after lesions in the lungs, the lymphatics, and the other tissues of the body had healed or become quiescent. Pathologists learned that tuberculosis of the spleen might in this sense become primary.

So-called primary tuberculosis of the spleen, according to Winternitz, may develop at any age, but is most common in young adults, both men and women being equally affected. Abdominal pain with palpable tumor occurs in 70 per cent of the cases. Magnac says:

"A spleen presenting local tuberculosis is always increased in size. . . . Primary splenic tuberculosis always gives rise to splenomegalia."

In chronic cases the symptoms are loss of weight and weakness; in more acute cases they are fever and lassitude as in other infectious diseases. The blood findings may be normal or there may be increase or decrease of either white or red cells. Winternitz reports tuberculosis of the liver in 80 per cent, of the lymph nodes in 57 per cent, and of the lungs in 40 per cent of his cases. Of the 51 cases only 1 showed tuberculosis confined entirely to the spleen. The pathological findings in the spleen are not unlike those in secondary tuberculosis, varying with the stage of the infection and the reaction of the tissues to it. In acute infection the organ is large and congested. As the disease becomes chronic it contracts. A spleen with chronic tu-

*Read in Section on Surgery, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

berculosis shows fibrosis and caseation in varying degree, depending upon the virulence of the infection and the resistance of the patient.

The diagnosis of primary tuberculosis of the spleen is not often made before operation. Magnac reports that the preoperative diagnosis was made only once in 19 case reports reviewed by him. When splenomegaly does not conform to any of the better known types of splenic anemia, when the blood picture is inconclusive, when the symptoms are indefinite, when there is apparently essential splenomegaly, tuberculosis should be suspected and an attempt made to get a history of exposure to tuberculosis or of some previous disease that might have been tuberculosis. If there are large calcifying masses in the spleen they may be recognized by x-ray and the diagnosis be assured.

All are agreed that the only effective treatment for primary tuberculosis of the spleen is splenectomy. If this is not done the patient ultimately dies.

CASE REPORT

Mrs. E. G., a widow, aged 38 years, entered the Columbia Hospital, an ambulance case, August 31, 1923, complaining of weakness and of vomiting blood. She gave a history in a married life of 10 years of having had two miscarriages and no full-time pregnancies. Menstruation had always been irregular and scanty. She had had indigestion since childhood. This had been worse for three months. There was pain in the upper abdomen about a half hour after eating, which was relieved by soda. There had been no heartburn, belching or vomiting before the present attack. She had malaria several times. The present attack began one week previously, on August 24, 1923, with a chill, pain in the upper abdomen, vomiting and rectal tenesmus. On the fifth day she vomited a cup of blood, and the next night she again vomited blood. Her stool was black and tarry. On admission into the Hospital she had 70 per cent hemoglobin, 4,300 leucocytes, and normal urine. The red cells were not counted nor was a differential count made of the leucocytes. Her temperature was 100, pulse 80, respiration 20, and her Wassermann negative. Physical examination showed a fat pale woman with normal lungs and heart. There was a tender mass filling the upper left abdomen, extending one-half inch below the navel.

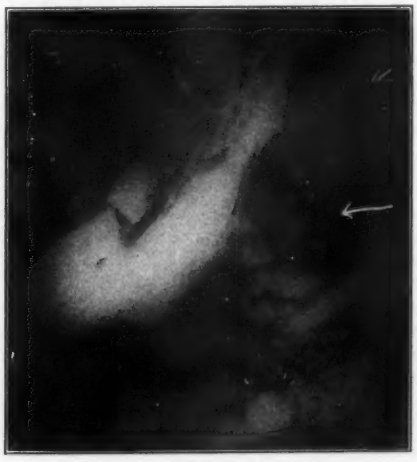


Fig. 1
X-ray of abdomen taken before operation showing calcified tubercles of spleen, normal pylorus and duodenal cap.

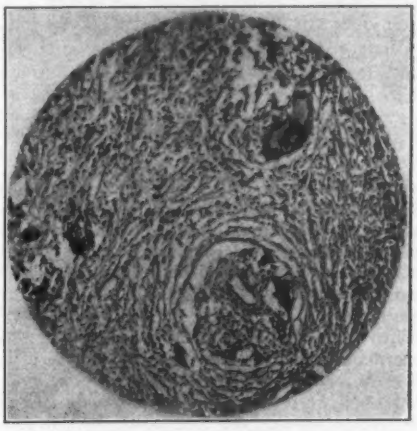


Fig. 2
Low power section of spleen showing giant cell typical of tuberculosis.

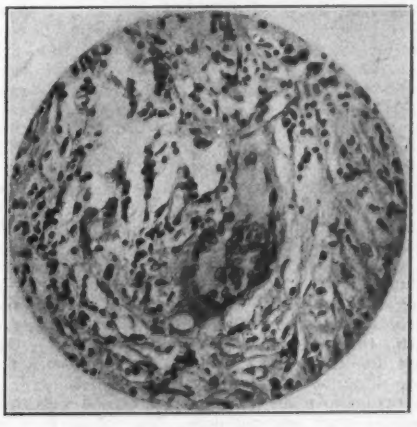


Fig. 3
High power section of spleen showing giant cell typical of tuberculosis.

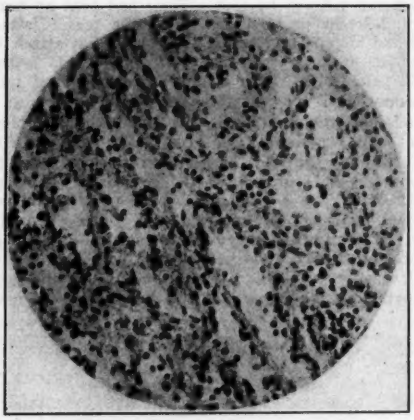


Fig. 4
High power section of spleen showing sinus endothelial proliferation typical of Banti's disease.

From its shape and characteristic notch it was identified as the spleen. On September 1, she vomited blood. Thirty cubic centimeters of whole blood were injected into her gluteal muscle. An x-ray picture after bismuth had been given did not show ulcer, but did show irregular shadows in the region of the spleen from areas of calcareous degeneration. On September 2, she vomited blood, and on September 3 there was a large hemorrhage from the stomach and the systolic pressure fell to 78 mm. Four hundred cubic centimeters of citrated blood were given, after which the systolic pressure rose to 98 mm. In four hours she had another hemorrhage and I was asked to operate upon her.

While she was being transfused, under ether anesthesia, we made a high midline incision. The gall-bladder was without stones. The liver showed no gross abnormality. There was no scar nor evidence of gastric or duodenal ulcer. The veins of the stomach from pylorus to cardia were greatly dilated; some were nearly the size of the small finger of an adult. The spleen was enlarged and was so fixed by fibrous adhesions that it had coalesced with the surrounding viscera. The adhesions were so binding that the spleen had literally to be torn from its bed. The attachments to the diaphragm, stomach, descending colon and to loops of small intestine were freed with extreme difficulty. Much of the capsule of the spleen was left attached to the other organs. When one pulled on the spleen trying to free it, one had the impression of almost lifting the patient from the table. Bleeding was not profuse, although the vessels were friable and forceps would bite through when applied. To get better exposure the left rectus muscle was divided at a right angle near the lower end of the incision. After a tedious dissection most of the spleen was removed, but the condition of the patient was not good and further operative work was not done. The splenic fossa was packed with a roll of gauze, 5 yards long and 2 inches wide, and with 5 large gauze pads. The ends of these with the handles of 11 hemostats were left through the right angle cut after the midline incision was closed.

A stormy convalescence was complicated by intestinal fistulae. One must have been in the upper intestine, for the dressings became saturated soon after fluids were swallowed. Another must have been in the colon, for there was fecal drainage from the wound. The forceps were removed on the fifth day and the packing on the seventh day. After some weeks the discharge stopped and the wound healed without hernia. The patient soon regained her strength and after seven years remains in good health.

After having been in formalin solution for some days the spleen weighed 335 gm. It was friable and on section resistance was found in the form of calcareous masses surrounded by dense fibrous tissue. These were scattered through the spleen, but were more numerous near the large vessels. Much of the capsule was gone. There was evidence of severe chronic perisplenic inflammation. A piece of the spleen was sent to Dr. Francis Carter Wood, of New York, for microscopical study. He says: "The spleen shows two lesions, one which resembles what is described under the general name of Banti's disease, that is, extreme arteriosclerosis, with marked thickening of the wal's, even of the veins. Some of the arteries are extensively calcified, with calcium deposits in the elastic tissue lamina. Some are wholly closed by chronic process. The splenic tissue proper shows marked dilatation of the sinuses, with swelling of the sinus endothelium and numerous large cells in the lumina, a picture which is described as occurring regularly in Banti's disease. The lymphoid structures are somewhat atrophic, though remnants of the Malpighian follicles still persist. In addition to these lesions there are some old calcified tubercles with giant cells at the periphery of the lesion; also some more recent scattered small tubercles, each usually con-

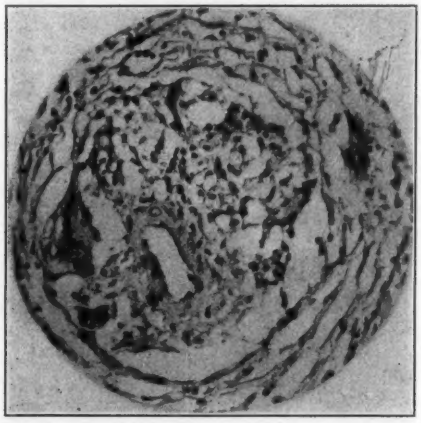


Fig. 5
High power section of spleen showing marked arteriosclerosis.

Fig. 6
Negative chest plate.

taining a giant cell and a small number of endothelioid cells. Here the lesion is morphologically so characteristic of tuberculosis that we need not consider the possibility of syphilis.

"If I were to see the splenic tissue alone, I would say it is a typical case of Banti's disease, but of course the size of the spleen does not correspond with that syndrome, as it is usually larger and firmer. In many of the Banti cases the liver enlargement is only moderate, and no cirrhosis may be present. The idea that Banti's is a definite disease is gradually being abandoned. Probably characteristic splenic lesions can be produced by a number of toxic agents."

Surgical tuberculosis of the spleen is comparatively a rare lesion. In a series of 530 splenectomies done at the Mayo Clinic from 1904 to 1929, in only 9 cases was there tuberculosis which appeared to be limited to the spleen, while there were, according to W. J. Mayo, 144 cases of chronic splenic anemia, many of which had progressed to the Banti stage of secondary portal cirrhosis and ascites. No mention was made of any case in which both tuberculosis and Banti's were found. Nor have we found in the literature mention of such relationship in any given case. This case is unique in having sections characteristic of both diseases in the spleen. It is a case of primary tuberculosis of the spleen; for no matter where the primary focus may have been, at the time of operation the spleen was apparently the only organ involved. The lymph nodes were not enlarged and an x-ray picture of the chest showed the lungs unaffected. We have found in the literature only 2 cases of hemorrhage in tuberculosis of the spleen.

Case 1.—Douglas and Eisenbrey report in a man of 39 years a severe hemorrhage from the bowels and stomach on two occasions, once in March, 1909, and again in October, 1910. In November, 1912, splenectomy was done and the patient died on the ninth day from gangrene of the intestines with thrombosis of the aorta and large branches, tuberculous peritonitis and pulmonary tuberculosis.

Case 2.—Balfour, in January, 1917, reports at length the very interesting case of a man of 45 years in 1913 seeking treatment for bloody stools. In early life he had a tuberculous infection of the cervical lymph nodes. The fluoroscope showed a healed pulmonary lesion. Proctoscopic examination was negative. On January 13, 1914, he was explored for gastric ulcer. None was found. The gall-bladder with a stone was removed. The veins of the stomach were everywhere much distended. On March 26, 1914, the patient was again explored after a copious hemorrhage from the bowel. A posterior gastroenterostomy was done on the assumption that the hemorrhage was due to erosions of the gastric mucous membrane. On December 20, 1914, a left kidney was removed. In October, 1915, he was explored for recurring bleeding from the bowel. A scar near the pylorus was suggestive of ulcer and was excised with the cautery. The patient had postoperative vomiting and was reoperated upon and an enteroanastomosis and jejunostomy were done. In De-

Fig. 7
Gross section of spleen after removal, showing multiple calcified areas.

cember, 1915, he returned after having vomited blood and passed blood by bowel. Splenectomy was done and the patient has remained well and free from hemorrhage since operation. No pathological report is given of the spleen nor is a diagnosis given of the disease causing the bleeding.

Hemorrhage from the stomach is a common complication of Banti's disease, but is rare in tuberculosis. Moynihan says the cause is cryptic. Some consider it the result of toxemia. Pool says:

"When there is obstruction to the venous flow in the splenic vein, the venous blood from the spleen of necessity passes by way of the left gastroepiploic and vasa brevia tributaries of the splenic vein to the stomach, and thence by anastomoses into the other veins. Under such conditions varicosities occur in the veins of the stomach and there readily rupture and cause hemorrhage."

We think the extreme varicosity and bleeding from the stomach in our case was due to passive congestion of the stomach from obstruction of the sclerosed splenic vein by the calcareous tuberculous masses along it.

CONCLUSION

This is a case of primary tuberculosis of the spleen with repeated gastric hemorrhages, in good health seven years after splenectomy.

Some sections of the spleen are typical of Banti's disease. Others are typical of tuberculosis.

The tubercle bacillus is possibly the cause of both conditions.

The treatment of primary tuberculosis of the spleen is splenectomy.

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DISCUSSION (*Abstract*)

Dr. H. R. Shands, Jackson, Miss.—Tuberculosis of the spleen notoriously does not cause anemia; also tuberculosis is more prone to cause calcareous changes than any other disease. The x-ray in a case which we saw showed one large calcareous lymph node on the right side of the spine. After carefully weighing all the evidence a diagnosis of tuberculosis of the spleen was made, which subsequently proved to be correct. The disease was confined to the spleen, which was twice its normal size and contained five calcareous nodules as large as a marble.

Investigation of the literature reveals that tuberculosis of the spleen is practically always fatal unless splenectomy is performed. In our case, the involvement of the spleen was no doubt secondary to the involvement of a mesenteric lymph node. No evidence of tuberculosis was found anywhere else in the body.

Dr. Wallace Frank, Louisville, Ky.—Some years ago we saw a child of about three years of age with all the symptoms of purpura hemorrhagica. There were 1,700,000 red blood cells, the platelet count was very low and the bleeding time prolonged. Careful study revealed no evidence whatsoever of childhood tuberculosis and a diagnosis of purpura was made. Splenectomy was done and the microscopical study of the spleen revealed tuberculosis. Not being satisfied with the report of our local pathologist, we submitted the slides to several men in the East and in each case a diagnosis of tuberculosis of the spleen was made.

Dr. Bunch has reported a case of tuberculosis of the spleen in which the symptoms resembled those seen in Banti's disease. Our case of splenic tuberculosis had symptoms of purpura hemorrhagica. With such variations in the symptoms produced by this disease one begins to wonder whether Banti's disease and purpura hemorrhagica are definite entities or whether they may be manifestations of a specific infection of one type or another in the spleen, the reaction of the individual determining the clinical picture.

Dr. Bunch (closing).—I hope any of you who have occasion to consider operation upon patients who are bleeding from the stomach will consider tuberculosis of the spleen as a possible cause.

ALLERGIC MANIFESTATIONS IN CHILDREN BASED ON THE STUDY OF FOUR HUNDRED EIGHTY-TWO CASES*

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It is a source of much pleasure to the writer to note the awakened interest by the American physicians, especially the pediatricians, in the study of asthma, hay-fever, urticaria, migraine, and certain forms of eczema and colitis, syndromes that have perplexed the medical profession for ages. Much research work on allergic diseases has been done in the last decade, thereby greatly improving methods of diagnosis and treatment. The greatest advancement has been made in the discovery of newer methods of determining the cause of allergic conditions other than hay-fever and asthma, namely, migraine, urticaria, and certain forms of eczema, colitis, and epilepsy.

RELATION BETWEEN ASTHMA, SEASONAL HAY-FEVER, PERENNIAL HAY-FEVER, MIGRAINE, URTICARIA, AND CERTAIN FORMS OF ECZEMA AND COLITIS

It is generally accepted that the exciting cause of all seasonal hay-fever and practically all cases of true bronchial asthma is a sensitization to foreign protein. There is good evidence that the transmission of the ability to become specifically sensitive follows Mendel's law and that the nature of the inheritance is as a single dominant factor. Cooke and Van der Veer[1] have offered evidence to show that asthma and hay-fever are interchangeable in the linkage. We[2] have not only shown that asthma and hay-fever are interchangeable in the linkage, but that perennial hay-fever, migraine, urticaria, and certain forms of eczema and colitis, in the linkage are interchangeable with asthma and hay-fever, and interchangeable with each other.

HAY-FEVER

From the literature one would naturally be led to believe that hay-fever in children is uncommon. Seasonal hay-fever during the first decade is to some extent rare in many sections of the United States, but in the Great Southwest in which we live to have a child come to the office suffering from typical hay-fever symptoms, all of which appeared suddenly, and which symptoms, if watched, would cease with frost, is a common occurrence. Eye signs in children are usually present and prominent. Itching and congestion of the nose, with frequent sneezing, is often very disturbing.

Perennial hay-fever, which is frequently unrecognized by the general practitioner and even by the pediatrician and the rhinologist, is a common occurrence in children throughout every section of the United States. It is manifested clinically by a chain of symptoms relative to the upper respiratory tract and the eye due to a general hypersensitive state, but the onset and disappearance of symptoms are not so dramatic as seen in seasonal hay-fever. Eye signs in perennial hay-fever are frequently not present. A congested nose with frequent sneezing in the morning, symptoms which clear away in the later hours of the morning and reappear again in the evening, are common findings in perennial hay-fever. Many of these cases develop a deformity of the roof of the mouth, which in turn means work for the orthodontist. In a series of 441 perennial hay-fever cases we[3] studied some years ago, which included both children and adults, we found itching of the mucous membrane of the nose practically always constant, so constant that we felt that it might be considered a pathognomonic symptom of protein sensitization.

From our previous study and our present study it appears that when the symptom of itching of the nose is definitely present careful study from an allergic standpoint is always justified. Pediatricians should keep in mind that the itching referred to is not just an uncomfortable feeling in the nose or the inner canthus of the eye, which may be due to purulent secretions, but a definite unquestionable itching.

A child born with the ability to become specifically sensitive to pollen and to have seasonal hay-fever should have, and usually does have, the ability to become sensitive to other substances, such as animal dander, dusts of various kinds, and foods, and therefore frequently will develop other allergic syndromes.

From the 45 uncomplicated seasonal hay-fever cases in children, only 5, or 9.9 per cent, were sensitive to pollen only. The other 90.1

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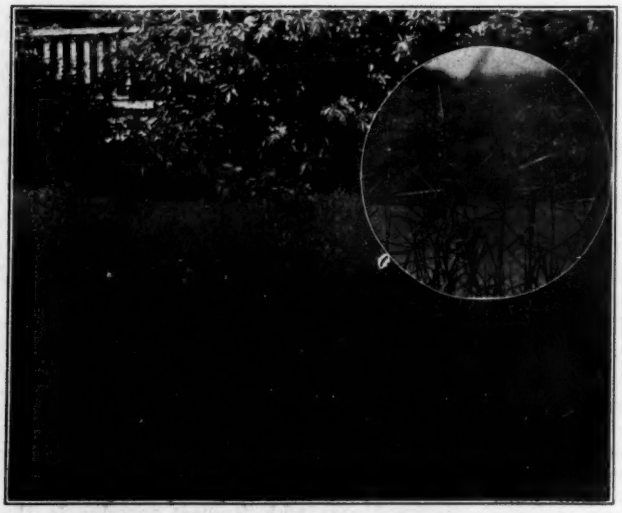

Fig. 1

Bermuda grass lawn one week after being cut. Inset shows pollinating heads. The common use of Bermuda as a lawn grass and the long period over which it pollinates provide adequate pollen contact for children who play on the lawns. It is a common cause of seasonal hay-fever, perennial hay-fever, and asthma, and the grass itself is an occasional cause of contact dermatitis.

per cent were definitely sensitive to other substances, yet they did not have symptoms out of the pollen season. From 118 cases of perennial hay-fever in children, only 26 were not sensitive to pollen. In other words, pollen is a definite factor in both seasonal and perennial hay-fever. This is especially true in the Great Southwest. Throughout the Great Southwestern territory in which we live plants are pollinating at least nine months out of the year. Many children suffering from seasonal hay-fever have symptoms from early spring until late fall. To show that seasonal hay-fever is not uncommon south of the Mason and Dixon line, and especially in the Great Southwestern territory, from our records of 482 allergic children 45, or 9.3 per cent, had typical uncomplicated seasonal hay-fever. Out of this number 12, or 26.6 per cent, developed symptoms before they were 5 years of age. I have seen children with typical seasonal hay-fever as early as 3 months of age. The men in the East and North have difficulty in understanding why we see many seasonal hay-fever patients in the Southland. They do not realize that the pollen content of the air of the South varies greatly from that of the North. Most children are multiple sensitive. They do not become sensitive to pollen only, but become sensitive to pollen, a n i m a l emanations, and dusts of various kinds.

In talking to physicians and mothers concerning the possibility of animal dander and various dusts as a cause of nasal symptoms in their children, we find that it is difficult for them to understand the possibility of contact. They do not realize that every home, so to speak, has a menagerie. For example, many homes have from two to twelve feather pillows and from one to three feather beds; some of them are renovated frequently and some of them have not been renovated for years, consequently the dust that constantly comes from them as the feathers break, due to constant usage, saturates the home with feather dust. The overstuffed furniture contains horse hair, rabbit hair and pig hair, and many other substances to which children may become sensitive. The better grade of mattresses contain either horse hair or curled pig hair. Wool makes up a large per cent of the floor covering. Underneath many of the floor coverings is ozite, which is a combination of hair, chiefly cattle hair. The clothing is either wool, silk, or wool fiber stiffened with the hair of various animals, for example, horse hair. The constant use of clothing, rugging, bedding, and so on, means in time that the home is saturated with the dust of various animals.

Many homes are saturated with insecticides, which contain pyrethrum, to which many children become sensitive. Practically every home is more or less saturated with orris root, which is found in creams, rouges, face powders, body powders, cleansing lotions, skin foods, tooth pastes, and soaps.

COMPLICATIONS

It has been previously mentioned that many children suffering from seasonal hay-fever also have a sensitization to other inhalants, but have no symptoms after killing frosts. These children are all candidates for either perennial hay-fever or asthma. So far as we can esti-

mate, about 60 per cent of untreated seasonal hay-fever both in children and adults finally develops into asthma. Asthma is more frequently a complicating factor in perennial hay-fever than in the seasonal type.

URTICARIA

Urticaria is common in childhood and is a constant problem for the pediatrician. It may appear as a very fine rash, which is commonly called nettle rash. Frequently it makes its appearance on the skin over various parts of the body in the form of elevated white patches of various size and shape, which appear suddenly, often without accompanying or preceding symptoms of any sort. This type is known as giant urticaria, which involves not only the superficial layer of the skin, but the deeper structures. The third type of urticaria, spoken of as angioneurotic edema, is uncommon in childhood but common in the adult, especially over 40 years of age. That protein sensitization is a causative factor in a large per cent of urticaria cases of all types is exceedingly probable and is now generally accepted by the majority of the men working in the field of allergy.

ECZEMA

By no means are all cases of eczema in childhood due to a hypersensitiveness to foreign protein, but it appears to be the sole cause or a contributing factor in a fairly large per cent. The medical profession is just beginning to recognize the important role that food sensitivity and sensitization to other substances play in the cause of dermatitis. It has been pointed out by us[4] that the dermatologist obtains good results in 30 to 40 per cent of the cases of eczema he treats, with the use of the x-ray or through local applications; the pediatrician relieves about the same number of children who suffer from eczema by manipulation of carbohydrates and proteins in the diet; but there is at least 70 per cent of the children who do not respond to such measures. Many of these cases are due to a specific sensitization to one or more foods in their diet, or to substances to which they come in contact, and on removing the food from the diet, or protecting them against the substances to which they come in contact, such as insecticides, or plant life of various kinds, symptoms will disappear in a very short time. Foods that cause eczema are usually common ones, such as wheat, eggs and milk, but eczema may be due to any food, and it is usually a combination of a sensitivity to many.

MIGRAINE

The migraine syndrome is a snag over which the medical investigators have stumbled in centuries past. Dr. Warren T. Vaughan,[5] of Richmond, Virginia, reported a series of cases from which it appears that migraine of all ages is often associated with a specific sensitization to one or more food proteins. The author has shown that migraine is interchangeable in the linkage with asthma and hay-fever, which is good evidence that asthma, hay-fever, and migraine have a common etiologic factor, which has thrown new light on the subject. We have been very much interested in a study of a series of 168 cases of adults who suffer from migraine, to note that 32.1 per cent gave a history of the onset of their symptoms during the first decade. We have seen a number of typical migraine cases under 10 years of age. Most of the migraine children we have seen came for the treatment of some other form of allergy and incidentally we found they were sufferers from headaches. In none of the cases had the headaches been diagnosed as migraine. Some of them reported that they had been sent to the eye men for investigation, but were told that nothing could be found except a small amount of astigmatism. Some of them suffered so severely that they had been sent home by their teacher on account of their headaches associated with vomiting. It is interesting to note that migraine headaches in children frequently do not have all the classical symptoms usually found in the adult migraine sufferer. This is likewise true of other allergic syndromes, especially asthma. The writer wishes to urge the pediatrician to watch for migraine in children, because from our study it appears that it is not uncommon. Dr. Isaac A. Abt[6] reports that migraine is common in childhood, but does not even suggest the possibility of a food sensitivity as an etiologic factor. When a child comes to the physician complaining of headaches, especially periodic in type, either associated with, or without, abdominal symptoms, migraine should be thought of, especially if there is a family history of allergy.

ASTHMA

By no means is asthma in childhood an uncommon disease. It is conservatively estimated that 1.5 per cent of the population of the United States suffers some time in life from asthma. Our records show that more than 50 per cent of the asthmatic sufferers develop symptoms

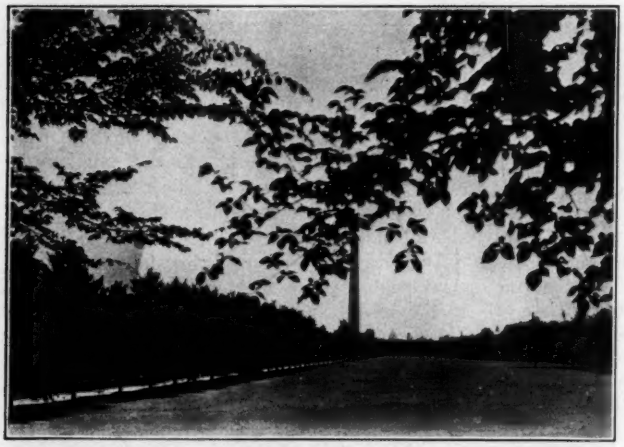

Fig. 2. Elm (Ulmus Americana).
A common shade tree south of the Mason and Dixon line. A frequent cause of typical seasonal hay-fever, atypical colds, and asthma during the late winter and early spring.

before they are 12 years of age. In other words, nearly 1 per cent of the children of the United States have asthma in some form. Until relatively recent times little was done for asthma in childhood other than palliative treatment. The medical profession considered it in the category of minor human ailments and there were good reasons for this attitude. In the first place, asthma seldom caused death, especially in childhood, and in the second place, the physician could do very little or nothing towards relieving it. The parents were assured that their children would outgrow their asthma.

SYMPTOMS OF ASTHMA IN CHILDREN

The asthmatic syndrome in childhood is not always easy to diagnose. During the first decade asthma often manifests itself first in the form of what appears to be croup, bronchitis with fever, or attacks which simulate bronchial pneumonia. Many asthmatic children who are mildly sensitive to animal hair, instead of having typical asthmatic paroxysms as seen in the adult, will develop an acute coryza which will in turn involve the bronchial *cul de sac,* causing cough; in some cases a small amount of fever, and lots of loose mucus, but with no definite wheezing. Others who are more highly sensitive to animal danders or the dusts of the home, or to food, will develop periodically, with or without coryza, an apparent bronchitis with or without fever, with definite wheezing that can be detected by the parents. A third type who are markedly sensitive to various substances, such as animal hair, food, and pollen, either with an acute infection of the upper respiratory tract, or without the infection, will develop suddenly a temperature ranging from 103 to 105, with much mucus in the chest, and with all the ear marks of bronchial pneumonia, except that they wheeze.

Not infrequently in the past pediatricians have gone to homes and seen such cases and have said to the mother, "This child has bronchial pneumonia and will be sick for two or three weeks, therefore you had better get a special nurse," to be chagrined the next morning when they came to find the child playing about. There is one differential point between asthma and true bronchial pneumonia, namely, that of wheezing. A true bronchial pneumonia case does not wheeze. The asthmatic child who has frequent attacks of asthma, who will develop a true infection causing bronchial pneumonia, or lobar pneumonia, will not have an attack of asthma at the same time. The fact that fever is present and fairly high frequently causes the physician to make a mistaken diagnosis. One must remember that in the child the heat regulating mechanism is not a stable one and therefore high temperatures develop with ease. For example, marked constipation may cause high temperature, to be relieved by simple means, such as an enema.

COMPLICATIONS OF ASTHMA IN CHILDHOOD

At least 60 per cent of those who suffer from asthma also suffer from a type of perennial hayfever. Many asthmatic children are nose and eye rubbers. In some cases the tendency towards nose rubbing is so great that deformity of the nose has developed. Many of them develop infection of the antra. From our study it appears that in nearly all cases the chronic infection is not the primary cause of their asthma, however.

Children do not have a tendency to develop polypi, which are frequently seen in the adult. Many children, due to labored breathing, develop emphysema of various degrees. Emphysema of the first degree is not serious. If the

asthma is fairly well controlled the deformity will not be noticed as the chest develops. Emphysema of the second degree, that type that has a considerable degree of deformity of the chest, will right itself if the attacks of asthma are controlled fairly well before complete sternal ossification occurs. However, the individual with the third degree of emphysema has a complicating factor that will probably interfere seriously with obtaining good results in the treatment of asthma. A fourth degree deformity usually means a sufficient amount of emphysema and bronchiectasis to prevent obtaining good results.

OTHER ALLERGIC CONDITIONS

There are other symptoms or symptom complexes due to a specific sensitivity, which are seldom thought of by the physician as being due to a sensitization. Such symptoms or syndromes as indefinite abdominal pain with or without mucous colitis, certain types of irritation, and occasionally epilepsy, may be due entirely to sensitization to food or drugs, and should receive greater recognition. Rowe[7] has very ably called our attention to the importance of food in such symptoms.

Not infrequently abdominal symptoms due to allergy are somewhat localized in the right lower quadrant, and along with the symptoms there may be vomiting. Such a combination has caused more than one patient, unfortunately, to be operated upon for appendicitis. In a patient who has one or more of the allergic syndromes, such as asthma, hay-fever, eczema, urticaria or migraine, and who has abdominal pain or vomiting suggestive of some surgical condition, the surgeon should take into consideration very carefully the possibility of the symptom or symptoms being allergic. Likewise the same caution should be taken into consideration in patients who have a family history of allergy. In any case, of course, it should be kept in mind. Vomiting and abdominal pain due to food sensitization is seldom accompanied by fever, but may be at times. In the opinion of the author food allergy is much more common in both mild and severe forms than is generally accepted.

METHODS OF TESTING FOR SENSITIZATION

There are three methods of testing for sensitization, namely, the scratch, intradermal, and patch methods. The scratch method of testing should always be done first to be sure that one is not dealing with a very hypersensitive individual. The intradermal method of testing is required in practically all cases in order to find the various etiologic factors. The patch method is one that is very important in cases of contact dermatitis.

In some allergic patients the positive factors cannot be found. For example, in some cases of urticaria, migraine or eczema, the foods to which the patient is specifically sensitive cannot be found by any method of testing. In such cases eliminative trial diets, as suggested by Rowe,[8] should be used.

PREDISPOSING FACTORS

In practically all allergic conditions there are predisposing factors which help in precipitating the attack. For example, in asthma cold air or non-specific dusts will help in precipitating an attack of asthma in one who is specifically sensitive to foods, animal danders or pollen. In urticaria or eczema local irritation, sudden changes in body temperature, or mental and depressed states, play a part in bringing on the attack, although they must be considered secondary factors. In typical seasonal hay-fever in children it is common for them to have a blocked nose, with marked sneezing, and even lacrimating eyes, the morning after a severe rain, when it is still raining, and there is no pollen in the air. Here the cold air is acting as a secondary factor.

TREATMENT OF ALLERGIC DISEASES IN GENERAL

The treatment of allergic diseases, whether asthma, perennial hay-fever, seasonal hay-fever, urticaria, migraine, or certain types of eczema, colitis or epilepsy, should consist of first controlling the predisposing factors in the most practical way possible, thorough elimination of the exciting factors that can be eliminated, and desensitizing against the exciting substances that cannot be eliminated.

The question often arises as to whether results in the treatment of allergic diseases justify the investigation required to determine the various factors and the treatment given. Today, with few exceptions, results in the treatment of allergic diseases in children are more satisfactory than the treatment of almost any other chronic disease. Most allergic children are above normal physically except for their allergic symptoms, and are also above normal mentally. If their allergic symptoms are eliminated they have little to contend with so far as physical and mental difficulties are concerned. There-

fore, if the treatment of other chronic diseases in children is worth while, and it is, although the outlook frequently is not bright, how much more are we justified in a careful study and treatment of allergic children, over a period of years if necessary, for relief or cure.

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SECONDARY GASTRIC DISTURBANCES OCCURRING IN PULMONARY TUBERCULOSIS*†

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and
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The secondary gastric disturbances due to pulmonary tuberculosis are of unusual interest. This is due largely to the fact that in this disease, especially in its incipiency, the primary symptoms are frequently entirely gastric in character and consequently often overshadow the pulmonary signs. This interest is further revealed by the many publications bearing upon this subject. We need refer here only to the papers of Edinger,[1] See,[2] Brieger,[3] Hildebrandt,[4] Einhorn,[5] Immermann,[6] Klemperer,[7] Stockton,[8] Fenwick,[9] Boas,[10] and Lawrason Brown.[11] Although the stomach is ordinarily exempt from the lesions of tuberculosis, yet dyspeptic symptoms are frequent in this disease. These manifestations may be according to Fenwick,[12] of two distinct types; the initial and the terminal dyspepsias. Stockton[8] points out that the initial type is manifested in many instances in the form of an "irritable stomach," the symptoms occurring as a result of vagal irritation, the clinical picture resembling that resulting from chronic irritation of the appendix or gallbladder. He terms this "tuberculous dyspepsia" revealed in the form of an irritative or vagotonic neurosis. On the other hand, there can be little doubt that in the initial stages even when a rise in temperature is entirely absent, toxemia may play an important role in the production of dyspeptic symptoms.

Rehfuss[13] points to the importance of visceral focal infections in resistant cases of pulmonary tuberculosis. He has been able to demonstrate in some instances infection of the bile of the gastric mucous membrane as well as of the intestinal tract with various organisms which he considers potent in causing a lessened pulmonary resistance.

In our study we have selected 100 cases of pulmonary tuberculosis, of which 50 presented the initial and 50 the terminal types of dyspepsia.

(1) *Initial Dyspepsia.*—According to Fenwick,[12] dyspeptic symptoms are observed in about 70 per cent of cases of early tuberculosis, but the development of these manifestations is dependent largely upon the sex of the patient, type of pulmonary involvement and the previous state of the digestive tract. Lawrason Brown[11] notes that a majority of patients having pulmonary tuberculosis are affected with indigestion. The patients, according to this authority, who escape have been, in the main, careful eaters with normal appetites. Alcoholics and those individuals who have previously consumed food inordinately are apt to suffer most difficulty in this respect. Even though the gastric functions are not seriously involved, digestive disturbances may occur, but on the whole, according to Brown, the gastric tolerance is usually well preserved in many instances in this disease. Hutchinson[14] (1855) was the first to publish an accurate account concerning the frequency with which dyspepsia is associated with the development of pulmonary tuberculosis. He maintained that this condition was present in 92 per cent of his cases, and in 55 per cent of these, symptoms were marked. On the other hand, Samuel Fenwick found a percentage of 83 in a series of cases observed at the Victoria Park Hospital.

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According to Fenwick, the digestive symptoms become more marked in those instances in which the pulmonary tuberculosis originates insidiously and progresses gradually. In the very acute forms, as in miliary tuberculosis, while gastric symptoms are always present, appearing early and are prominent, yet as the pulmonary manifestations become intensified these symptoms are overshadowed to such a degree that they assume but a minor role. In the more chronic variety, however, inasmuch as the pulmonary symptoms are not as yet pronounced at this stage, the patient's attention is centered more fully upon his digestion and he is on this account more likely to attribute such conditions as loss of flesh and weakness to the gastric disturbance. On the other hand, Brown considers the type of the disease of far less importance than its acuteness in its relation to digestive upsets. According to him, females are more susceptible to indigestion than males. In Fenwick's series of 96 women, 84 per cent were affected, while of 78 men there were but 52 per cent. In our series of 50 cases of pulmonary tuberculosis in which an initial dyspepsia occurred, there were 7 instances of the acute type. In 4 of these, the digestive disturbance was severe, in 2 moderate, and in 1 mild. The remaining 43 cases were of the more chronic variety of tuberculosis. Of these digestive disturbances were severe in 29 cases, moderate in 10, and mild in 4.

Attention has been directed by Fenwick to the relation of the indigestion present previous to the onset of the tuberculous dyspepsia. In his series of cases, 72 per cent of females and 17 per cent of males had been affected some time before with disturbances of the digestion from which he draws the conclusion that inasmuch as females are more liable to dyspepsia of the initial type than males, that a previous attack of indigestion does not disturb this relation following the onset of the tuberculous disease.

The ages of our cases range between 20 and 70 years.

The following table presents our cases arranged according to age and sex:

Ages	Females	Males
20 to 30	5	4
30 to 40	10	4
40 to 50	16	3
50 to 60	5	1
60 to 70	2	0
Total	38	12

The symptoms usually manifested during the stage of the initial dyspepsia are loss of appetite, nausea, vomiting, pain and discomfort in the abdomen and constipation.

Loss of Appetite.—Loss of appetite is extremely common and not infrequently marked anorexia occurs. This is especially noted when severe constitutional symptoms develop. Many patients have a lack of appetite, but notwithstanding this, succeed in forcing food. Others frequently continue to retain a normal desire until food is served, when this quickly disappears. Desire for food is frequently influenced by fever and is often especially lacking in the evening, when the temperature is at its height. There is an especial repugnance for fatty foods in this condition. According to Hutchinson's observations, there was a distaste for all forms of fats in 71 per cent of his cases, and complete anorexia in 33 per cent, while 5 per cent exhibited an increased appetite for this foodstuff. Fenwick noted an aversion for fat in 64 per cent of his cases; the dislike having taken its origin in 39 per cent at the time of the onset of the tuberculosis; while in 61 per cent it was present previous to this period, increasing, however, with the onset of the dyspepsia. Fenwick further calls attention to the fact that in many of his patients the desire for bacon was greatly increased, notwithstanding the persistent abhorence to other forms of fatty meats. He likewise points out the dislike in many instances in the early stage to sweets, there being, however, more of a lack of desire than a real aversion for this foodstuff. This occurred in 7 per cent of his cases at that period when symptoms of indigestion began to appear. In Hutchinson's series 29 per cent presented an aversion for sweets; in 8 per cent this distaste was first noted following the onset of the pulmonary tuberculosis. Occasionally a lack of desire for alcohol in individuals accustomed to the use of this stimulant and not infrequently its use produces indigestion. There can be no question that in those individuals addicted to excesses in alcohol the prognosis for recovery is unfavorable.

In our series of 50 cases with initial dyspepsia, there occurred a moderate loss of appetite in 31 instances, marked anorexia in 11, and the appetite remained normal in 8.

After the dyspepsia has become more chronic, the appetite may become capricious, the same foods being relished at one time and not at another; or the appetite may be normal at one meal and not at another or on one day and not

on another. The taste may be altered in other instances and there may be a desire for foods which were previously distasteful, a craving being often developed for acids, such as acid fruits, pickles and vinegar. Occasionally, there may even be a morbid desire for strange forms of food and, according to Boas,[10] even bulimia may occur.

Nausea.—Nausea is not infrequent and may be present as a premonitary symptom before the signs in the chest are sufficiently developed for diagnosis. It may persist off and on during the entire course of the disease and resist all means of treatment. This symptom may occur early in the morning and may finally result in vomiting, though this does not always follow, or it may appear at any time of the day. It is increased when the patient is subjected to forced feeding and is at times induced by coughing and during the periods of increased temperature. In our series of 50 cases, nausea occurred to a moderate degree in 23 instances, it was severe in 5, and was not present in 22.

Vomiting.—Vomiting may appear without nausea and is most frequent on arising in the morning due to an irritation in the throat or to paroxysmal cough induced in an effort to expel mucus. Under these conditions it in no way interferes with the digestion of food following its subsidence. However, in the more chronic types it may follow nausea appearing after meals; but it may even then be associated with cough, which may add materially to the difficulty in feeding the patient. On the other hand, vomiting may occasionally precede all other symptoms. Forced feeding often induces emesis which likewise occurs at times when the temperature rises in the evening. The vomitus consists mainly of undigested food and ordinarily contains a considerable admixture of mucus. When the vomiting becomes excessive it may also contain bile. Nausea and vomiting may persist even though the disease becomes arrested. Ordinarily, however, these symptoms disappear when this takes place.

In our series vomiting occurred in 36 instances, in 21 of which it remained moderate; it was severe in 15 and was not present in 14.

Pain and Discomfort.—Pain is a rather frequent symptom at this stage. It occurred in 92 per cent of Fenwick's cases. It is not uncommonly associated with discomfort, fullness and distention appearing after meals, though occasionally it occurs independent of food intake. It may appear several hours after meals, and when associated with symptoms of hyperacidity may lead to an erroneous diagnosis of duodenal ulcer. In the very early stages of this affection, the pain may only be associated with a single meal, but as the disease progresses it becomes rather constant. The pain may be referred to the epigastrium, though it frequently radiates into the chest in the region of the heart and under the lower sternum. It may be intimately associated with the change in gastric acidity. When the acidity is high it is commonly accompanied with heartburn and acid eructations, and when low it occurs immediately following meals and is often relieved by the use of adequate doses of muriatic acid. Pain and discomfort occurred in 42 of our 50 cases. It was moderate in 29 and severe in 13 instances.

Constipation.—This is a very frequent symptom in the initial dyspepsia of pulmonary tuberculosis. It is at times extremely persistent and difficult to overcome. The stools are usually light in color, covered with much mucus and contain considerable undigested food remains. Intercurrent attacks of diarrhea may occur which become more frequent as the disease progresses. Constipation existed in 37 of our cases; it was moderate in 23, and severe in 14. Diarrhea occurred in 4 instances and the bowel movements were normal in 9.

Physical Examination of the Abdomen.—The physical examination of the abdomen at this stage does not as a rule reveal any abnormalities. At times evidences of an enteroptosis are noted, at others tender areas are detected in the epigastrium or in other portions of the abdomen. Atony of the stomach is not an unusual finding.

Examination of the Gastric Contents.—Numerous observations have been reported on the changes in the gastric secretion in this affection. Brieger[3] records a normal gastric chemical content in the incipient cases, while in the slightly more chronic types he found the acidity was normal in 33.5 per cent of his cases, reduced in 60 per cent and absent in 6.6 per cent. Klemperer,[7] on the other hand, notes that in his examinations the gastric acidity was usually found increased, rarely reduced and often normal in the early stages. Einhorn[5] observed but slight changes, while according to Hildebrandt[4] the secretion of hydrochloric acid is directly influenced by the fever, inasmuch as when this is continuous the acid is suppressed; however, fol-

lowing the subsidence of the temperature it again reappears.

The motor function of the stomach is usually normal in the early stages, but is reduced with the progress of the disease. According to Brieger,[3] it is always diminished when the free hydrochloric acid is lessened, but never according to Jaggi[15] when hyperacidity exists.

It is an interesting fact that tubercle bacilli can commonly be obtained from the fasting stomach in individuals affected with incipient pulmonary tuberculosis, often before the definite physical signs of the disease are revealed. This finding, first noted by Hausmann, has been confirmed by Bassler[16] as well as by Jaggi. In addition there will be noted an increase of gastric mucus and the presence of swallowed mucopus.

In our 50 cases of initial dyspepsia the gastric contents revealed hyperacidity in 21 instances, normal acidity in 22, subacidity in 4, and achylia in 3.

Roentgen ray studies of the digestive tract were made in all of our cases. In the cases of initial dyspepsia, no lesion was observed in the stomach or duodenum. In 8 there was evidence of adhesions associated with the appendix or actual deformity of the appendix. There was no evidence in any of these cases of the hyperperistalsis and hypertonicity described by Brown and Sampson, which is commonly observed in the more advanced cases.

Course and Prognosis.—The prognosis of the initial dyspepsia is largely dependent upon the progress of the pulmonary lesion. If the disease is arrested, the dyspepsia will ordinarily disappear; if it advances, however, the gastric disturbance will also become more aggravated, though its character may become altered under these conditions.

(2) *Terminal Dyspepsia.*—As the tuberculous disease of the lung progresses and the final stage appears with great destruction of the lung tissue, the digestion also becomes more involved and the symptoms of indigestion more pronounced. The dyspepsia which was present in the incipient stage may alter its character so that, for example, such symptoms as nausea and vomiting may disappear and be replaced by pain; or the same symptoms occurring in the initial dyspepsia may become intensified or finally the dyspepsia may be entirely overshadowed by the pulmonary symptoms. In rare instances, the pulmonary symptoms may remain latent even in this stage and the digestive disturbance be the entire cause of the patient's complaint. Fenwick calls attention to cases of this type under his care in which the tuberculous disease was not even suspected until shortly before death. Of 316 of his cases of pulmonary tuberculosis with cavity formation, 135, or 42.5 per cent, were affected with dyspepsia. Females are more susceptible to the terminal dyspepsia than males. In Fenwick's series the proportion was 62 per cent of females to 25 per cent of males.

In our 50 cases of advanced pulmonary tuberculosis in which the terminal form of dyspepsia occurred, there were 31 females (62 per cent) and 19 males (38 per cent). Of these 50 cases the digestive disturbance was severe in 36 instances, moderate in 12, and mild in 2.

The ages of our cases of this type ranged between 23 and 58 years. The following table presents our cases arranged according to age and sex:

Ages	Females	Males
20 to 30	11	9
30 to 40	13	7
40 to 50	5	2
50 to 60	2	1
Total	31	19

The symptoms manifested during this stage are loss of appetite, nausea, vomiting, pain and discomfort in the abdomen and disturbance of the bowels.

Loss of Appetite.—The appetite usually decreases progressively until complete anorexia occurs; though occasionally there may be periods when it returns to normal or is even increased. Here, too, as has been observed in regard to the initial dyspeptic type, in some instances, the appetite may even become capricious, the same food being relished on one occasion and not at another. The taste may be altered, too, at times and there may be a desire for food previously distasteful, a taste developing especially for acid food. There is often a lack of desire for fatty foods and sweets and even when consumed in moderate amounts these will frequently produce indigestion. In Fenwick's series fat disagreed in 57 per cent of cases and sweets in 8 per cent. While the loss of appetite may be continuous and extreme, it may occasionally be retained even to the last or be increased. A marked increase in temperature is ordinarily associated with extreme anorexia. Increased thirst is usual at this stage and is

most frequent between meals. It is often associated with a rise in temperature. In our series of 50 cases with terminal dyspepsia there was a moderate loss of appetite in 14 instances; marked anorexia in 31, and the appetite remained normal in 5.

Nausea.—Nausea is frequent at this stage and is often associated with lack of appetite and vomiting. It may persist during the entire stage and resist all efforts for relief. Even following vomiting it may continue. It not uncommonly occurs early in the morning and is then induced by cough, though it may appear at any time of the day. High temperature and forced feeding usually increase this symptom. In our series of 50 cases presenting the terminal stage, nausea occurred moderately in 18, was severe in 25, and was absent in 7 instances.

Vomiting.—This symptom may appear without nausea and is then most frequent in the morning, due to attacks of coughing. It usually follows nausea, but may even under such conditions be associated with cough. When it occurs following a meal, the food is rejected in an undigested state. The vomitus is usually acid and contains large amounts of mucus. According to Fenwick but 32 per cent of his cases presented this symptom, though others consider this estimate too low. In our series vomiting occurred in 26 instances (52 per cent), in 11 of which it continued moderately; it was severe in 15, and was not present in 24.

Pain and Discomfort.—While pain in the region of the stomach is not so frequent during the terminal stage as in the initial, discomfort is more common and most patients exhibit more or less distress in the form of fullness, distention or flatulency. These symptoms may occur following or be independent of food. The pain may be of a burning character in the epigastrium and extend to the chest and is ordinarily increased by pressure in this region. In 135 cases of this type recorded by Fenwick, only 46, or 41 per cent, presented this symptom. In our series of 50 cases pain and discomfort occurred in 43 instances; it was moderate in 28, and severe in 15.

Disturbance of the Bowels.—While constipation is most common at first, occasional attacks of diarrhea occur, which increase in frequency and become persistent, causing intense weakness and exhaustion. They are often intractable and resist all means of treatment and in themselves may be responsible for bringing about an earlier termination of the disease. The stools are usually light in color and even when solid contain mucus and undigested food particles, even before the stage of tuberculous ulceration of the bowel occurs. It is beyond the province of this paper to attempt a description of the character of the stools following the invasion of the intestine with the tuberculous disease. Of the 50 cases of our series, the stools were normal in 4 instances, constipation occurred in 9, alternating constipation and diarrhea in 14, and diarrhea in 23.

Physical Examination of the Abdomen.—As the disease progresses and emaciation becomes more and more pronounced, evidence of enteroptosis with atony of the stomach becomes pronounced. The examination of the abdomen will disclose varying conditions according to the extent of the secondary involvement of the intestine as well as of other organs with the tuberculous disease. In cases of moderate severity in which there has been as yet but a slight or no secondary invasion of these organs, the abdomen is usually soft, relaxed and extreme tenderness will be manifested in the epigastrium, and at times along the course of the entire or portions of the colon. Even at this period a slight enlargement of the liver with tenderness in this area may be noted. A gastric catarrh is by this time almost invariably present. As the disease advances, however, the ravages of the secondary involvement become evident, depending largely upon the degree of invasion. The abdomen becomes rigid, distended and evidences of free fluid in the abdominal cavity are manifested and extreme tenderness and pain are observed in palpation.

Examination of the Gastric Contents.—The stomach in the stage of terminal dyspepsia ordinarily presents a high grade of motor and secretory insufficiency. These changes may occur due to the production of toxins as well as from the developing chronic gastritis. As a result there is a delayed gastric evacuation or atony. The acidity is usually reduced as well as the pepsin concentration, but the latter does not run parallel with the reduction of acidity. Hildebrandt considers the diminished secretion of acid due to the rise in temperature, though this view has not been accepted by others. On the other hand, all authorities are not in accord regarding the changes occurring in the gastric secretion in advanced pulmonary tuberculosis. Immermann was able to detect the presence of free acid frequently, while Einhorn finds it present irregularly and Klemperer notes that it

gradually disappears with the advancement of the disease. According to our experience, as the mucous membrane becomes involved in an extensive secondary chronic gastritis, the secretion of free hydrochloric acid is rapidly diminished and a true achylia is finally produced, and at the same time the motor function of the stomach becomes impaired. The gastric content at this stage reveals an absence of free hydrochloric acid and the presence of a considerable amount of mucus much in the form of swallowed clumps. In our series of cases of advanced pulmonary tuberculosis the gastric contents presented a normal acidity in 5 instances; hyperacidity in 3; diminished acidity in 15 and achylia in 27. There was therefore present in these cases a combined hypochlorhydria and achylia in 42 cases (84 per cent).

The roentgen signs are most important at this stage. There were no lesions detected in the stomach or duodenum in any of our cases. However, the spastic irritability of the terminal ileum, cecum and proximal colon, as described by Brown and Sampson, was observed in 39 of our 50 cases (78 per cent), indicating a definite secondary involvement of the bowel. Our experience is entirely in accord with that of Smithies, Weisman and Fremmel[17] that important diagnostic information in regard to these lesions may be obtained by means of barium enemas.

Course and Prognosis.—When the dyspeptic symptoms are firmly established, they rarely disappear, but are likely to progress and may then in themselves account often for a rapid fatal termination. If the tuberculous affection, however, is arrested, the gastric symptoms may likewise diminish, and if finally cure is brought about a disappearance in the dyspepsia may even occur.

Treatment.—The treatment of the gastric disturbances of pulmonary tuberculosis can only be symptomatic, inasmuch as this must necessarily be especially directed to the primary disease. Nevertheless, much can be accomplished in relieving distressing symptoms and in restoring the digestive functions, so that the patient will be able to consume sufficient food to aid in overcoming as far as possible his pulmonary disease. It cannot be denied, however, that the dyspepsia associated with pulmonary tuberculosis is less amenable to treatment than when of different origin. Diet plays an important role in this regard. From his studies McCann[18] has drawn the conclusion that the optimal protein requirement for tuberculous patients when at rest is between 60 and 90 grams per day with approximately a 2,500 caloric intake. Martin[19] also maintains that the ideal diet for this type of patient is one which is largely restricted to meet the requirements of the body needs. When at rest this should consist, according to him, of about 2,500 to 3,000 calories daily; containing approximately 60 to 90 grams of protein; about 200 grams of fat and 100 grams of carbohydrates. When undergoing exercise this should be increased to about 3,200 to 3,500 calories containing about 125 grams of protein.

Inasmuch as many of these patients suffer from undernutrition, it is important that the diet should not be restricted any further than is deemed absolutely necessary and should, as far as possible, be of a high caloric type, containing the proper vitamin content. Caution, however, must be directed against overfeeding. The fattening methods commonly practised in the dietetic management of tuberculous patients often provokes more harm than good because it throws a great burden on the already disturbed digestive tract. The food suited to the patient's condition should be given freely, heavier meals during the period of apyrexia, and lighter food in the afternoon and evening. Feeding should be moderate, though frequent, and in many instances, especially where there is secondary involvement of the bowel, food should be given in a bland form to avoid the irritation in this region produced by the passage of roughage. Milk is an important food in this affection and when it does not produce distress can be given freely, though it must be remembered that the plan formerly practised to a greater degree than at present of forcing large amounts of milk and eggs has disturbed the digestion sufficiently of many a tuberculous patient so as to make it impossible afterward to again restore this function. When milk disagrees, it should be modified. Buttermilk or some fermented form of milk may act as a substitute. Eggs can often be taken freely, but should not be forced, as they may cause indigestion. Cereals, broiled tender meats, vegetables (pureed if necessary) and fruits as well as toast bread serve best as the most suitable articles of diet. When there is a great distress the patient must, at least for a time, be placed upon a soft diet. Fatty foods often cause anorexia and should be given only with great caution. The diet should be carefully arranged for the individual patient and, above all, it is important

that the amount of food taken should be sufficient to maintain the general nutrition as far as this is possible.

Lavage of the stomach at night will frequently relieve nausea, vomiting and distress. This is often best accomplished with the duodenal tube. Drugs play an unimportant role in the treatment of the indigestion associated with pulmonary tuberculosis. When hyperacidity exists, alkalies should be administered and when the acid is diminished or absent muriatic acid is indicated. For the gastric pain and discomfort, a spirits of chloroform mixture is serviceable at times, and for the nausea and vomiting such remedies as subcarbonate of bismuth, cerium oxalate and creosote in small doses have been found helpful. Occasionally hot water taken before meals will tend to overcome nausea. An ice bag to the abdomen will also often give considerable relief.

CONCLUSIONS

The secondary gastric disturbances due to pulmonary tuberculosis are of unusual interest. Although the stomach is ordinarily exempt from the lesions of tuberculosis, yet dyspeptic symptoms are frequent as the result of the pulmonary involvement. This may occur in two types: the initial and the terminal dyspepsia. In the initial type, females appear to be more susceptible than males and a previous attack predisposes to a similar condition following the onset of the pulmonary disease. The symptoms during this stage are loss of appetite, nausea, vomiting, pain, and discomfort in the abdomen and constipation.

The examination of the gastric contents does not, as a rule, reveal a diminution in acidity, and the motor function remains normal.

In the terminal dyspepsia, the digestion becomes more seriously involved and the symptoms of indigestion more pronounced. The dyspepsia of the initial stage may alter its character and the symptoms be replaced by others; or they may become increased or may be entirely overshadowed by the pulmonary symptoms. Females are also more susceptible to the terminal dyspepsia than males. The symptoms during this stage are similar, but more intense than those accompanying the incipient type; those, however, referable to the intestinal tract are more frequent. The examination of the gastric contents presents a high grade of both motor and secretory insufficiency, the gastric acidity being greatly reduced.

The treatment of the dyspepsia occurring in pulmonary tuberculosis should be directed to the primary disease. Much can be accomplished, however, in relieving distressing symptoms in restoring the digestive functions. Diet plays an important role in this regard, but should not be too restricted. Food should be consumed in sufficient amount to maintain the general nutrition, but great care should be exercised to avoid overfeeding so as to prevent the onset of more serious digestive upsets.

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DISCUSSION (*Abstract*)

Dr. Charles G. Lucas, Louisville, Ky.—Dr. Friedenwald has presented a paper that is unusually complete. I feel that there are many here in the audience who could discuss it much better than I. Dr. Pottenger and Dr. Alvarez agreed with me that many times in tuberculosis we have changes in the muscles of the tongue and mouth on that side. Therefore, the changes in the stomach may have some relation to the changes in the tongue and mouth. There was one thing that interested me, namely, the finding of tubercle bacilli in the gastric contents. I follow the rule of Dr. Gaither in having the patient come to the office without eating or drinking or brushing the teeth; then I pass a stomach tube.

Dr. Frederick K. Herpel, West Palm Beach, Fla.—I have been interested in pulmonary tuberculosis since my association with the Army Hospital in Denver during the late years of the War. Dr. Friedenwald has covered the subject so thoroughly that it leaves nothing for academic discussion. There is one thing, however, which I am sure Dr. Friedenwald has taken into consideration many times, especially from the roentgeno-

logical findings, that many patients with far advanced tuberculosis will show gastric symptoms. When you do a gastrointestinal series with the x-ray you will find nothing to account for the indefinite gastric symptoms which are present. You will find in quite a number of these patients a diffuse enlargement of the heart and aorta. At autopsy you will find that these patients have a marked fibrosis with displacement of the mediastinal structures. I believe this is a factor in the production of the gastric symptoms in cases in which you do not expect to find these symptoms as a result of toxemia or ingestion of the tubercle bacilli. Pressure on descending nerve trunks, chiefly the vagus, seems to be responsible for the occurrence of many of the abdominal symptoms in fibrous tuberculosis.

Dr. M. Jay Flipse, Miami, Fla.—Some of our greatest difficulties in cases of pulmonary tuberculosis arise from the gastrointestinal symptoms. There is frequently a considerable element of the functional associated with these disorders. A number of them are benefited by hydrochloric acid and others by raw liver. In one patient with marked diarrhea, from ulcerative tuberculous colitis, raw liver in orange juice appeared to regulate the bowels nicely. The anemia in this case also improved while under this form of treatment.

Dr. James T. Wolfe, Washington, D. C.—Eight years ago at Chattanooga I read a paper on vagus reflex as an etiologic factor in bronchial asthma. My observations since that time have not tended to lessen my faith in the theory I then advanced. Before presenting that paper I had heard Dr. Pottenger in Washington speak of the flush in the cheek on the side of the pulmonary lesion in tuberculosis, caused by reflex disturbance by way of the vagus and the fifth nerve. According to authorities I have been able to study, it seems there is a synaptic union between the descending branch of the fifth nerve and the nucleus ambiguous in the medulla, and stimulation arising from irritation of the ethmoid region can be transmitted by way of this union down the motor fibres of the vagus, causing bronchospasm. Evidently in the vagus we have misdirected messages, that is, the motor impulses do not return to the site of irritation, but are shunted off some other fibres to a remote region as we see in the mechanism where a colonspasm or a pyloraspasm is produced by stimuli arising in the region of the appendix or of the gall-bladder. In the same manner the stimuli may be shunted off to the bronchial tubes, producing asthma. Since hearing Dr. Alvarez yesterday associate abdominal disturbances which follow attacks of migraine with this migraine, it has occurred to me that this phenomenon occurs from the same mechanism by way of the fifth nerve, nucleus ambiguous and the descending branches of the vagus. Likewise it is probably involved in the cases described by Dr. Friedenwald. The stimuli arise in the inflamed lung, pass up the sensory fibres of the vagus to its nucleus in the medulla, whence they are spilled back down the vagus, disturbing any of its sensory, motor or secretory functions.

Dr. A. L. Levin, New Orleans, La.—I should like to ask Dr. Friedenwald if there is anything in the literature to explain why tuberculosis in the stomach itself is so rare. I saw only one case with Dr. Matas many years ago. Tuberculous lesions in the small intestines are common. Cancer of the stomach is common, but of the duodenum and small intestines very rare. It seems that cancer cells require an acid medium and cannot propagate in an alkali medium, while with the tubercle bacillus it is just the reverse. In tuberculosis, hypochlorhydria is common. Dr. Friedenwald reports 42 per cent of patients with very low acid and some with achylia. The toxemia of tuberculosis evidently causes a reduction in the gastric acidity and the bacilli cannot propagate in an acid medium.

Dr. Friedenwald (closing).—Anemia is usually associated with the dyspepsia of pulmonary tuberculosis. We have utilized liver together with iron rather frequently with beneficial effects in the treatment of this condition. Stockton calls attention in his book to vagal irritation as a potent cause of the symptoms observed in the dyspepsia of pulmonary tuberculosis. Tuberculous lesions of the stomach are quite uncommon. I have seen but one case. There has been no satisfactory explanation for the rarity of this involvement. Recently Hurst (Guy's Hospital Reports, October, 1930) has reported a case of combined tuberculosis and carcinoma of the stomach, and Sprunt (*Surgery, Gynecology and Obstetrics*, 51:245, 1930) collected thirteen and added a fourteenth of his own.

MODERN METHODS IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

By Oscar O. Miller, M.D., F.A.C.P.,
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All methods of treatment in tuberculosis are based upon the extent and character of the lesion and the presence of symptoms of toxemia and of tuberculous complications.

The treatment of this disease should not be undertaken without first securing satisfactory roentgenograms of the chest in question, no matter how clear cut the physical signs may be, for films are indispensable in planning treatment. Their intelligent interpretation, with an appraisal of symptoms and complications, is the basis on which treatment is founded.

The methods available are: routine bed rest, with the usual dietetic hygienic regimen, postural rest, shot bags, sling, chest splints or special corsets; compression therapy as represented by phrenicectomy, artificial pneumothorax, and thoracoplasty. For the usual complications associated with tuberculosis, special treatments are in vogue, such as heliotherapy, electrocautery and ultraviolet radiation.

In Louisville only 15 per cent of all patients admitted to the Sanatorium are minimal cases, and these are the only ones in whom recovery can be expected with routine rest. It is patent

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that the other 85 per cent who are in the moderate and far advanced group will require, in the majority of cases, some form of special treatment to bring about an amelioration of symptoms or an arrest of the pulmonary lesion. Fifty-one per cent of our patients are far advanced, and for these surgical intervention, wherever feasible, is a necessary form of treatment.

ROUTINE

We may dismiss the 15 per cent of minimal cases by stating that routine rest and a full nutritious diet may be all that is necessary for their recovery. Usually these patients are kept in bed until they have had three months' normal temperature. At the end of that time they are permitted to sit up one hour per day, increasing one hour per day until they are up all day. If there is no reaction following this, they are sent to the main dining room for meals, and then placed on ten minutes' walking exercise, increasing five minutes a day until they are walking one hour a day without reaction. They are later placed in the Department of Occupational Therapy, where they work four hours a day, and if there is no reactivation and if the lesion is apparently arrested, or quiescent, they are discharged and recommended to return to their previous occupation, provided it is nonhazardous, either to them or the public.

In the remainder of the patients, the following forms of treatment are available.

POSTURAL REST

Postural rest[1] [3] in unilateral disease is a valuable adjunct in the treatment of tuberculosis. In these cases, the patient is encouraged to lie on the affected side, preferably with a firm pillow placed under the lower ribs. This restricts the excursion of the chest, putting the lung at partial rest and thus promoting recovery. Where there are cavities it will be necessary for the patient to change the position to drain these. Such postural rest may be required anywhere for from one year or longer.

SHOT BAGS

In bilateral apical disease, with or without cavitation, the shot bag method of postural rest, devised by Webb,[2] is employed and is carried out by placing one pound of shot in a four-inch bag over the infraclavicular region with the patient lying on the back. The shot are gradually increased four ounces every week until they reach three to five pounds or that amount of shot which can be borne with comfort. Some patients show a remarkable tolerance and carry as high as 8 to 10 pounds of shot over one lung. This restricts respiratory excursion over the upper lobes and confines the movement to the lower part of the chest, thus aiding the patient in diaphragmatic breathing. Should the patient endeavor to carry more shot than is comfortable, discomfort may occur and a localized pleurisy develop in the first and second interspaces, due to pressure. The bags are worn for as long a time as is comfortable for the patient. This depends entirely upon the individual. Some patients are able to wear them eight to ten hours out of the twenty-four.

SLING

The hammock or sling method, introduced by S. C. Davis,[4] of Arizona, is applicable to unilateral cases and in this procedure the patient is suspended in a canvas sling 10 to 15 inches wide; from a ridge pole over his bed, the whole weight of his body resting in the sling with his shoulders and hips touching the bed lightly. This compresses the lung laterally and anteroposteriorly and brings about a remarkable clearing in selected cases. The patient lies in the hammock one hour a day and gradually increases the length of time. They soon become accustomed to this position and many of them remain in the sling ten to thirteen hours during the day. It is manifest that the exudative and infiltrative types, with considerable inflammatory reaction, are most adaptable to these forms of treatment and the fibroid types less amenable to any form of treatment.

Whenever cavitation develops some form of compression therapy is mandatory. If it is a thin-walled cavity, having the appearance of an annular ring, we may keep such a lesion under strict observation by frequent x-ray examinations. Some of these tend to clear by postural rest. Failing this, however, artificial pneumothorax should be induced.

PNEUMOTHORAX

Artificial pneumothorax is one of the outstanding contributions to the treatment of pulmonary tuberculosis. The initial results are often spectacular and brilliant, the end results too frequently disappointing. This is in no way the fault of the operation, but in the main due to poor selection of cases. Selection is not based on the desire for good statistics, but the operation is forced upon the operator, in the hope of controlling the disease, relieving symptoms,

and of prolonging life. As already intimated, pneumothorax is indicated in moderate or extensive unilateral disease that fails to undergo retrogression with routine treatment. Ordinarily the contralateral lung should be relatively clear, although slight non-progressive disease may be present providing it does not extend below the second or third rib. A free pleural cavity is a requisite for successful pneumothorax, although a good working collapse can often be secured in the presence of moderate adhesions. Persistent pulmonary hemorrhage is an indication for pneumothorax.

All cavities, especially those that give physical signs of their presence, require artificial pneumothorax or phrenicectomy or both. Cavities held open by adhesions may be closed at times by phrenicectomy;[5] when the lung is adherent to the diaphragm, relief of tension following the operation favors closure, although a fixed mediastinum is a prerequisite. In suitable cases, intrapleural pneumolysis[6] or the burning of adhesions according to the method of Jacobeaeus may bring about obliteration, although the writer prefers attempting this first by phrenicectomy.

If pneumothorax with its adjuvants does not bring about closure of cavities, thoracoplasty is indicated, if the contralateral lung is sufficiently clear. The requirements in this respect are exacting.

PHRENICECTOMY

Phrenicectomy,[7] or avulsion of the phrenic nerve, is a valuable adjuvant in the treatment of certain cases of pulmonary tuberculosis. It is ideally suited to unilateral disease with thin-walled cavities occurring in the second and third interspaces, and is particularly recommended in basal lesions. Following removal of the phrenic nerve and its accessories which are present in 90 per cent of the cases, there follows paralysis of the diaphragm on the operated side, with a consequent elevation of the dome into the chest of varying degrees. In some cases the diaphragm reaches to the third rib anteriorly. The reduction in lung volume is variously estimated as one-fourth to one-fifth. While this reduction in lung volume is essential to the closure of cavities, it is not the only factor in bringing about improvement. Fixation of the diaphragm, with resultant rest for the lung, contributes much to the amelioration of symptoms, and clearing and absorption of the inflammatory and infiltrative processes in the lung. The results obtained with avulsion vary with the selection of cases.

In our first series of 100 patients, 40 per cent showed definite improvement and eight had closure of cavities and a disappearance of the tubercle bacilli from their sputum. In the later series the results have been uniformly better, due to division of all accessory phrenic nerves. If a patient is a candidate for pneumothorax, he is also a candidate for phrenicectomy in the majority of cases and the phrenicectomy should come first. Where the cavities are thin-walled and situated in the infraclavicular region, phrenic avulsion will frequently bring about complete closure and render contemplated pneumothorax unnecessary.

THORACOPLASTY

Thoracoplasty has won a well deserved reputation in the treatment of tuberculosis, and when all other methods have failed, this is the final arbiter. It is suitable in chronic unilateral tuberculosis with cavity. It is imperative that the contralateral lung be free from active disease and that even arrested lesions should be of limited extent. The patients must be free from tuberculous complications.

In no other phase of surgery is there a greater need for the closest cooperation of physician and surgeon. The operation must be carefully planned in advance, in accordance with the extent of the disease and the patient's resistance. Wilms'[8] columnar resection done in two stages has lessened the operative mortality rate and improved the results. It is imperative that the ribs be resected well beyond the angle and as close to the head as possible. The amount of rib to be removed depends on the extent of collapse required. When large apical cavities are present, very extensive resection is necessary and hence fewer ribs can be resected at a session. Left-sided cases[9] can probably tolerate more resection than right-sided ones, owing to the thicker heart muscle on the left. All thoracoplasties should be preceded by a preliminary phrenicectomy when the diaphragm is mobile. Where the paralyzed diaphragm rises high in the chest, frequently a one-stage operation may be done by resecting from the first rib to the dome of the diaphragm, usually the first seven ribs. If further resection is necessary, a two-stage operation is indicated. Where the diaphragm is fixed with adhesions, the phrenicectomy may be done at the time of the thoracoplasty. The responsibility rests with the physician to recognize when recovery or arrest of the disease is not possible by the simpler methods of treatment and to recommend thoraco-

plasty while the patient is in good nutrition and is a suitable risk for operation. Too often the patient is permitted to become thoroughly depleted and thoracoplasty is accepted as a *dernier ressort*. In surgery speed is a factor, and good team work will make it possible to operate successfully upon a moderate number of the less favorable cases.

Following operation, it is necessary for the patient to lie on the side which has been operated upon to favor compression of the lung. After return to the sanatorium he should be placed in a sling or should wear a suitable thoracoplasty corset. In passing, mention may be made of plombage or extrapleural pneumolysis[10] as especially applicable for apical cavities where phrenicectomy has failed, where pneumothorax is impossible because of adhesions, and thoracoplasty hardly justified because the rest of the lung is relatively clear, or disease in the contralateral lung is prohibitive. Theoretically plombage with paraffin is an ideal procedure. It is attended by practically no shock and many patients are candidates for this intervention. Dense adhesions may render it impossible to strip off the parietal pleura overlying the cavity and in consequence the operation fails. The procedure may be considered *sub judice*, as we do not know the fate of paraffin packed in the thorax.[11]

Our own cases have been too few and too recent to warrant conclusions.

TUBERCULOUS COMPLICATIONS

Laryngitis.—In discussing the modern methods of treatment in tuberculosis it is incumbent to mention those complications common to the disease and for which special methods of treatment have been evolved. Tuberculous laryngitis[12] occurs in at least 25 per cent of the patients. For simple inflammatory lesions with but slight redness of the cord, or slight infiltration in the interarytenoid space, silence and relief from coughing will often effect a cure. For those with more involvement, heliotherapy with a solar laryngoscope quickly brings relief from pain and in time healing in the larynx. Where there is marked infiltration and swelling in the larynx, arytenoids, epiglottis, or ventricular bands, cauterization with the electrocautery gives excellent results. This is especially adaptable to those patients who, because of weakness or severe symptoms of toxemia, are unable to go through the exertion incident to heliotherapy of the larynx. We have used the water-cooled mercury arc lamp for local application to the larynx with negligible results. Some few patients have claimed relief. We use it routinely on cloudy days for those patients who ordinarily take sunlight. In the absence of adequate controls it is not feasible to compare results.

Colitis.—Tuberculous colitis occurs in 35 per cent of our patients and is one of the chief factors in delaying recovery in otherwise favorable cases. Heliotherapy is of inestimable value in the treatment of this complication. It is thought that ultraviolet rays are the chief curative agents in this lesion, and while direct proof is lacking, we do know that cure takes place when we resort to such exposures. One cannot discount the air baths and other rays reaching the body during treatment. For obvious reasons it is more convenient to use artificial light for radiation in this climate during the winter months, and for this purpose the mercury quartz lamp is the best. A multiplicity of technics have sprung up in the application of artificial light, all founded on fancy and few on facts. It is quite possible that any reasonable technic will give satisfactory results in favorable cases. The treatment must be continued one to two years to insure recovery. For simplicity, we prefer full body exposures at a distance of 30 to 36 inches. We expose one minute front and back, and increase the time one minute daily till a twenty minute exposure front and back is reached. The treatment may then be divided into ten minutes each over four body areas, two front and two back, and the lamp may be lowered one inch daily until tolerance is reached, usually at 10 to 15 inches. The lamp is then held at this point. The market is being flooded at the present moment with so-called health lamps. What is needed in the treatment of tuberculous enteritis is a therapeutic lamp that will give measurable results. The progress of the patient can be checked by the improvement in the general condition and from x-ray observation of the intestine with the barium meal. Why some patients develop tuberculous colitis and others with extensive disease escape is not known. It is possible that a deficient diet and lack of suitable vitamins may lay the ground work for this complication. This theory gains support from the fact that patients with tuberculous enteritis improve when vitamins are included in the dietary.[13] For this reason we have made it a practice to use cod liver oil, half an ounce, and tomato juice, three ounces, after meals in most of our cases. Cod liver oil becomes a food as well as a vitamin containing product. Viosterol is useless for this purpose

and has no influence on the intestinal tuberculosis.

In conclusion, one must bear in mind the Hippocratic aphorism, "Experience is fallacious and judgment difficult."

This is especially applicable to tuberculosis. The individual must be warned that once tuberculous, always tuberculous. If he gets well of his symptoms, he must henceforth learn to live with his tuberculosis.

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THE DIAGNOSIS AND TREATMENT OF EMPYEMA IN CHILDREN*

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In empyema thoracis, as in many other diseases treated surgically, when all the associated phenomena and clinical findings are present as given in most text books, the disease is in a late stage. Fortunately, in empyema the disease is not so rapidly fatal as in disease of the abdomen. By some it is thought best to let the condition become evident empyema before operating. I believe that whenever pus is found in the pleural cavity it is wisest to drain either by simple aspiration or through a small rubber tube by the closed method. A rib resection in the synpneumonic stage is meddlesome and dangerous surgery and is often the cause of a fatality.

The diagnosis of empyema in referred hospital cases is rarely difficult, as the symptoms and signs are usually definite before the patient is admitted. In this series of 52 cases none originated in the hospital. Since the disease rarely occurs as a primary lesion, a careful history must be obtained, paying special attention to the possibility of an antecedent pneumonia. A history of broncho or lobar pneumonia was obtained in 46 of our cases; two followed influenza and one, measles, so in 49 pneumonia was probably the preceding disease. In examination, inspection in a good light with the chest completely stripped of clothing and adhesive, is important. In the early cases there is always decreased expansion on the affected side, and in the late cases with bulging of the side, expansion is practically absent. The affected bulging side, however, may easily mislead one to consider the decreased expansion present in the non-diseased side. Diminished or absent breath sounds and fremitus, impaired percussion note, and displaced apex beat to the opposite side are the outstanding findings. Fluoroscopic and roentgenographic study should not be omitted, and are of special value in diagnosing the interlobar, mediastinal and supradiaphragmatic collections. If the possibility of atelectasis, and foreign body with its varied physical signs, is always considered in the history, examination and x-ray, there may be less chagrin for the diagnostician and possibly there will be fewer unnecessary punctures. If succussion or a tinkling sign is obtained, fluid and air are in the pleural cavity, and an open bronchopleural fistula is probably present, unless it has been previously aspirated and air has been allowed to enter. Unresolved pneumonia is a very rare condition and the diagnosis is too frequently made. In at least 90 per cent of these cases an empyema, pleural effusion, or lung abscess exists.

The blood findings are of little diagnostic assistance, for the leucocyte count may be high or low. In the 28 recorded cases, the lowest was 9,800, the highest, 38,400. A high staff count may be of grave prognostic value. Thirty-seven of these cases were treated during the first

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five months of the years from 1916-30, twelve occurring in March.

There were 32 boys and 19 girls. The right side was involved 20 times, the left side, 31 times. The pneumococcus was cultured in 21 cases, staphylococcus and pneumococcus in 1, and staphylococcus and colon bacillus in 1. Eleven negative cultures were obtained and 17 cases were not cultured.

Treatment.—In a review of the literature one is struck by the diversity of opinion as to the time to do the operation, the type of operation, the kind of anesthetic, whether or not to irrigate, to use a sterilizing or simple solution, to use the closed or open method of drainage, and whether to use negative pressure. Most surgeons today advise waiting until there is a frank collection of pus before doing a rib resection. This lesson was forced home by the frightful mortality experienced during the World War influenza pneumonia epidemic with its secondary empyema. Open operations during the synpneumonic stage have been generally abandoned. Graham has clearly shown the reactions that follow early pneumothorax: collapse of the affected lung, reduction of vital capacity by deviation of the mediastinum toward the opposite side compressing the good lung, and operative shock. To this should be added sudden reduction of intrathoracic tension in large collections of fluid with its train of circulatory disturbance. Reduction of tension in long-standing, large collection empyemas should be gradual just as in chronic retention in the urinary bladder. These dangers can readily be avoided by simple repeated aspiration and by the trocar-cannula tube closed method, so the surgeon using these procedures need not fear early operation. In children the disadvantages of resection when practised without preliminary aspiration are, first, a tremendous immediate mortality; second, great discomfort due to pain of the wound and filthy dressings, necessitating frequent changes and handling; third, the possibility of postural changes, followed by long corrective treatment, if not by permanent scoliosis due to lost support; fourth, secondary operations for osteomyelitis of the rib ends.

Todd and Butler report 154 cases with 12 per cent mortality. Farr and Levine reviewed 371 cases with 19 per cent mortality. Holt reported a 72 per cent mortality in 126 cases under one year of age and 52 per cent under two years. Spencer reported a 45 per cent mortality in 204 patients under three years, with a much higher rate for those under one year, or 64 per cent.

Rib resection was practically abandoned by my associate, Dr. E. S. Boice, and myself, ten years ago. During the past eight years two rib resections have been done on children. One was on a colored patient, who went home with a thoracotomy tube *in situ*. Subsequent treatment was inadequate, and she returned to the hospital with another accumulation of pus. The other case, for some unknown reason, did not drain satisfactorily.

The use of a general anesthetic in operating upon children who have empyema is rarely justified or necessary. It certainly adds to the operative risk. We use procaine or novocaine in 0.5 per cent strength to infiltrate the skin, subcutaneous tissues, muscles and pleura. After gradual decompression has been accomplished, we irrigate with Dakin's solution every two hours unless there is a complicating bronchopleural fistula. In the latter condition we use salt solution. Two of these children had this complication and recovered without undue delay. When pus formation has been controlled, the patients are allowed to return to the care of their family physician for dressing and daily irrigations, with instructions to return once a week for observation. The tube is not removed until the cavity is obliterated completely. The tract is obliterated by gradually shortening the tube. We have treated 70 cases, adults and children, by this method, and among those surviving there has been no recurrence and no case of chronic empyema. All have remained cured.

The adoption of the closed or open method of drainage in the trocar-cannula tube method is dependent upon the individual case. There are three deciding factors: the duration of illness, severity and intrathoracic tension. In short or serious illness, when any possibility of pneumonia is present, or large accumulations with displaced apex of heart, gradual reduction by the closed method is used. Otherwise, the method is optional.

We do not believe any form of negative pressure is justified that in itself forces these little patients to stay in bed. If we feel that negative pressure is indicated at each treatment, the air is prevented from entering and the tube is closed. In many cases a moderate negative pressure can be maintained for days. The value of negative pressure has not seemed great to us,

so most tubes are left open for drainage after a few days.

Our first thoracotomy case on March 20, 1916, had to be resected, as the poor quality tube, on the second day, broke off flush with the chest wall and a large piece was lost in the cavity. The tube was removed through the larger opening. The patient recovered.

This paper is based on the treatment of 51 children with pyothorax admitted to Park View Hospital from October 15, 1915, to October 15, 1930, a great majority since 1920.

The mortality in the 51 cases, 15 of which were resections and 36, simple punch thoracotomies, was 6 per cent. The death after resection is chargeable to the empyema mortality, as the patient never left the Hospital, but it seems hardly fair when one considers what the two-year-old child had gone through elsewhere, ether anesthesia and appendectomy; he was still draining pus from the abdominal wound, and had an unrecognized pneumonia and empyema, the latter of approximately thirty days' duration. The second case, following a thoracotomy punch in a child of one year who left the Hospital next day under protest and returned five days later in a desperate condition, with the tube out, must be accounted an empyema death, but we believe the child would have lived if he had not been taken from the Hospital. The third, a thoracotomy punch, we think should not be considered an empyema death, as he died at home two or three months later, following colitis and whooping cough. If we accept the two deaths occurring in the Hospital as the only ones chargeable to empyema, the mortality is 4 per cent.

The thoracic punch is a simple operation attended with practically no shock. We first cleanse the field with iodine, select a low point, usually the ninth or tenth interspace, posterior axillary or scapula line, unless there is a localized pocket. We infiltrate the skin for three-fourths of an inch, carry the infiltration down to the pleura, change the needle for a larger one and introduce it into the pleural cavity, aspirate pus, disconnect the syringe, and make one-half inch incision through the skin and deep fascia beside the needle in the line of the intercostal space. We introduce the trocar directly into the pleural cavity so as not to injure the diaphragm. We pull out the obturator, introduce the fairly rigid special tubing about 5 mm. in gross diameter, with lumen 3 mm. in diameter. This is the same size tubing as Mozingo recommends. We use it because it happens to fit our cannula. If the child is not very sick we practically evacuate the pus while the cannula is in position. This should not be done if there is a large accumulation, but the pus should be removed at intervals in order not to reduce the intrathoracic tension too rapidly. The sudden reduction of tension in very sick children by rib resection is, I believe, the chief cause of high immediate mortality, and deaths occurring in a few days are probably due to too great loss of vital capacity. If there are many fibrin plugs in the pus, the surgeon must use great patience and persistence to maintain drainage.

The tubing, twice the length of the cannula, with no opening on the side, should be introduced from three to four inches so as to reach well beyond the walling off process of the cavity. Then the cannula is withdrawn. An added advantage in leaving it long is that when the tube is blocked by a plug of fibrin it can be cleared by introducing a solution, shifting the tube and drawing the pus from another level. We treat our cases by both the open and closed methods. If there are no fibrin masses one can readily remove the contents of the cavity by suction and leave a negative pressure in the chest, which may aid in obliterating the cavity. We use Dakin's solution irrigations after operation when there are many plugs, but not until at least two days elapse, sometimes longer, depending upon the general condition of the child. We apply an air-tight dressing consisting of three inches of square rubber tissue made from the wrist of an old glove, punch a small hole in the center with pointed forceps and thread rubber tissue over the tube down to the small safety pin which has been placed through the tube a half inch from the chest wall. Beneath the pin and around the tube we place a small piece of sterile gauze. The sides of the rubber tissue are then sealed down to the chest wall with adhesive, the tube is tied off, if it is desirable, gradually to reduce the intrathoracic pressure by evacuating small amounts of pus at intervals. There are other useful means of maintaining tube in place.

After 3 or 4 days, when it has established a definite sinus, the tube may be removed to cleanse, to evacuate fibrin masses, or to replace it with a new one. We do not consider remov-

ing the tube permanently until the cavity is obliterated.

These little patients should not be intrusted to an intern or to a nurse unskilled in this method until all fibrin plugs have been evacuated. Many of the first few treatments require from one-half to one hour's time to maintain the proper amount of drainage.

We have had some desperately ill children, most of whose empyemas have been post-pneumonic. We have had nearly all varieties of encapsulated empyemas, even to multiple pockets. In two cases of apical empyema it was necessary to make a puncture high in the axillary space. Of course the encapsulated empyemas should be drained at their lowest point. These cases are apt to be early ambulatory ones and therefore should have dependent drainage.

The patients were in the Hospital from one to fifty-four days; the average was 16.75. After discharge they were seen at intervals while under treatment by their family physician. As all patients, with one exception, left the Hospital before the tube was removed, we are unable to say how long they remained in the chest.

The general supportive treatment, such as fresh air, forced feeding, cod liver oil, rest and sunshine, should not be neglected. Deep breathing exercises, bottle blowing, or some wind instrument should be prescribed.

This operation is not new, but, in the past, has not been given thorough trial by many surgeons. The recent literature shows many new methods being tried and would lead one to believe that rib resection with its high mortality is not satisfactory.

In our series there were two cases under one year, with one death. There were 8 cases, ages one and two years, with one death; 13 cases, age three to five years, with no deaths; 25 cases, six to ten years, inclusive, with no deaths; one eleven years, and two twelve, with no deaths.

Albert O. Singleton, reporting 81 patients of all ages treated by a modified closed method, lost five, a 6.3 per cent mortality.

McEnery and Brennemann, in an exhaustive article entitled "Aspiration in Empyema of Children," reported 33 children so treated, with three deaths. They state that "in children under 3 years of age, more especially in those under 2, and most emphatically in those under 1 year of age, we feel that a closed method of treatment is alone indicated."

Evarts A. Graham has convincingly shown the dangers of large openings in the chests of adults. Why is the same not true for the infant? A study of the frightful infant mortality following rib resection establishes his contention.

CONCLUSIONS

(1) Empyema cases should be diagnosed and treated early by aspiration or by thoracotomy punch for early cure.

(2) The most valuable four clinical signs are dullness, absent or diminished fremitus, diminished expansion, and displacement of the apex of the heart.

(3) Rib resection in children should be abandoned except in rare cases and then only after aspiration or thoracotomy have been thoroughly tried.

(4) Intrathoracic tension should be gradually reduced.

(5) The thoracotomy tube should not be removed until the cavity is obliterated.

(6) These patients treated by thoracotomy require close attention of skilled and interested attendants.

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DISCUSSION (*Abstract*)

Dr. John W. Price, Louisville, Ky.—All of us have had patients with empyema who recovered from simple aspiration. We have had patients who recovered from the punch and drainage operation and from rib resection, and there are advocates of each of these three methods.

The results of any treatment depend largely upon the technic of the operator, not only upon his immediate operation, but upon the subsequent care of the patient.

I wish particularly to commend Dr. Willis for his emphasis of the point that these cases are not to be handled after the operation by inexperienced nurses or inexperienced assistants. We certainly saw enough during the War of untrained medical men who were thrown into a surgical ward without any previous surgical experience. Although it is easy to make a hole in the chest wall, and many lives have been saved by prompt incision into the chest wall and draining out the pus, the inexperienced have failed to take care of that case and have failed to prevent the presence of a large cavity with a collapsed lung.

The morbidity following the unskillful postoperative care of these cases has resulted in that long list of operations to bring about a collapse of the chest wall.

At Camp Taylor in 1917, early rib resection was done on one service and followed by the usual high mortality. I aspirated my cases, and we had a very low mortality rate. This was subsequently proved to be the correct method of treatment.

It does not matter whether we cure these cases with aspiration alone or by cannula, if the case will drain; we had great difficulty with the clotting or coagulation of the lymph in the tube, but we do not give the care that Dr. Willis suggested. If the case did not drain through the tube we did a delayed rib resection.

Dr. Malcom Thompson, Louisville, Ky.—The physiologist has taught us that an open pneumothorax, a mobile mediastinum and a decreased vital capacity are dangerous and surgeons have been avoiding those dangers.

We have learned from Dr. Willis that the younger the child the greater the mortality. This has been the experience of other men. As an aid in preventing this high mortality, early diagnosis is essential, and a great factor in making an early diagnosis is the use of the lateral x-ray plate. A flat plate plus a lateral plate is of much greater utility than stereoscopic plates in detecting interlobar and other pocketed collections.

I, too, feel that the trend is of treatment definitely away from primary resection of the ribs. My own practice is to continue aspiration until the fluid is definitely purulent. Then a tube is inserted between the ribs. On the outer end of this tube there is a "Y" connection. The upper end of the "Y" is led to an irrigation bottle, while the lower end is led to a drainage bottle in which there is a small amount of antiseptic solution. The end of the drainage tube is always kept just below the surface of the fluid so that no air may enter the chest from the tube, thereby preventing an open pneumothorax. From time to time saline or Dakin's solution is allowed to flow into the chest from the irrigation bottle. Drainage with this method is usually profuse and recovery ensues in the great majority of cases.

A few cases do not recover with this method. Resection of the rib can then be performed. The mediastinum by that time will be less mobile, the vital capacity will be greater and the patient can more easily stand the shock of the open pneumothorax which will certainly occur.

It has been conclusively shown that the dangers of an open pneumothorax are in direct proportion to the size of the opening in the chest wall and the vital capacity of the patient. A large opening will probably be fatal to a patient with a greatly decreased vital capacity, whereas a patient with a normal or only slightly decreased vital capacity can easily withstand it.

Dr. J. D. Hancock, Louisville, Ky.—I think it was Dr. Robert Morris who described the four eras of surgery as the heroic, anatomical, pathological, and physiological. Dr. Willis' treatment certainly conforms to the present day physiological trend and for that reason deserves our serious consideration.

My preference has been for rib resection in these cases. Not only can the larger fibrin clots be better removed, but finger exploration of the pleural cavity is permitted and this enables us to drain pockets otherwise inaccessible. The shock of rib resection can be minimized by the use of local anesthesia, which is entirely satisfactory, and by gradual decompression of the empyema while the patient is on the operating table. Osteomyelitis of the ends of the rib usually occurs only when the exposed bone is denuded of its periosteum. Cutting the rib flush with the periosteum will generally prevent such infection.

Dr. J. W. Snyder, Miami, Fla.—I believe there is a tendency to overlook a most important point regarding the essential characteristics of empyema. Before the year 1917 we had to deal mainly with post-pneu-

monic empyemas due to the pneumococcus. Such empyema cavities were sealed off from the general pleural cavity by fibrinous adhesions and resection of a rib with open drainage was reasonably safe and effective. During 1917 and 1918 we came to deal with an entirely different type of empyema caused by the streptococcus. The pleural cavity in this type was not sealed off and drainage was not that of an infected pocket of the pleura, but of the entire pleural cavity itself. The open pneumothorax so produced in the presence of an already existing pneumonia was fatal in a large number of cases. A 75 per cent mortality forced upon us the necessity of adopting some different type of treatment. As a result the closed type of drainage and repeated aspirations with late drainage served to change the mortality rate to more normal proportions.

At the present time streptococcus empyema is seldom seen and we tend to forget the dangers of open drainage. In treating acute empyema the surgeon's individual preference for the open or closed method of drainage should have no bearing on the case. Investigation of the individual patient alone should determine the surgical procedure.

Dr. Frank K. Boland, Atlanta, Ga.—Dr. Willis mentioned the use of Dakin's solution, and we all recognize the value of Dakin's solution. It must be properly made. If it has less than 0.45 per cent chlorine content, it is inert; if more than 0.50 per cent chlorine content, it is irritating and may do more harm than good.

It is very important to have our Dakin's solution properly made. It seems that our pharmacies are not so careful in the manufacture of this solution in civil life as in military service.

THE TREATMENT OF RINGWORM OF THE SCALP WITH THALLIUM ACETATE*

By ROBERT L. KELLY, M.D.,
Louisville, Ky.

Treatment of ringworm of the scalp by x-ray offers certain difficulties. Young patients are frequently hard to hold in a fixed position during exposure; furthermore, permanent epilation may result. In the last ten years the literature has become voluminous in the treating of ringworm of the scalp with thallium acetate. I have made no attempt to delve deeply into this material. My object in writing this paper is to give my experience in a limited number of cases. The depilating action of thallium acetate has been known for about thirty-five years. It was used in tuberculous patients to check night sweats, but soon was abandoned because of joint pains and defluvium of the hair. In 1900, Sabouraud first used it in the treatment of ringworm of the scalp, but decided it was unsafe, probably due to the large doses that he employed. The credit for placing thallium acetate on a rational basis for the treatment of ringworm of the scalp belongs to A. Buschke, who, in collaboration with Bruno and Peiser, carried on experimental work on animals over a period of twenty years. They succeeded in determining the exact dose of thallium acetate per kilogram of body weight which was required to produce epilation of the scalp. On the basis of these experiments Cicero and Uruena of Mexico have treated over 1,500 cases since 1920 without ill effects. Buschke established the dose of thallium acetate to be 8 mg. per kilogram of body weight, but it has been used by several others in a dosage of 9 mg. per kilogram.

Extensive experimental work has been done on animals by Professor Dixon, of England, and others to determine the selective action of the drug on certain organs. Dixon proved that it heightened the excitability of the sympathetic system. For example, if the cervical sympathetic were stimulated to an electric current of certain strength specific effects were produced, such as erection of hair and dilatation of the pupils. If a sub-minimum current were used, these effects were absent. If, however, a dose of thallium acetate had been previously given, the same sub-minimum current then produced a marked effect. He stated that the action of thallium acetate was probably upon the cell station along the course of the sympathetic nerves, and not on the nerves themselves. It has been reported that the thyroid, parathyroid and suprarenal glands are affected in the administration of this drug, and that a glandular insufficiency results.

Thallium acetate is one of the heavy metals and is apt, like other heavy metals in toxic doses, to cause damage to different organs. It has been found, according to different authors, to have caused the following: inflammation of the gastrointestinal tract, hemorrhage in the liver, acute tubulonephritis, atrophy of the thyroid, parathyroid, suprarenal glands and testes, rachitic changes in the bones, high serum calcium and cataract, also pulmonary inflammation and congestion of the brain and meninges.

Within the last four years I have treated 46 cases of mycotic infection of the scalp with thallium acetate, and I shall briefly report my results. They were institutional cases, most

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of them wards of the Kentucky Children's Home Society. Their ages were between three and ten years, except one, whose age was twelve. Because the drug is more toxic as the patient approaches puberty, in my series of cases I gave the following doses: ages from three to six years were given 9 mg. per kilogram of body weight; ages from six to ten years were given 8 mg. per kilogram of body weight. The patient aged twelve was given 6 mg. per kilogram, with the idea of supplementing the drug with one-half unit of x-ray in order to complete epilation. The patient failed to report for treatment. This patient complained of muscular and joint pains of the legs on the fifth day, but was not confined to bed. This was the only patient, as far as we know, who developed toxic symptoms of this character. Two patients, ages five and seven, developed asthmatic attacks on the evening of the ninth day after the administration of the drug. I have not seen in the literature any account of similar attacks and do not claim that thallium acetate was responsible for the symptoms, but report this as coincident with the treatment.

The patients were prepared as follows:

(1) The exact weight of the naked child was taken.

(2) A routine examination of the urine was made.

(3) A dose of castor oil was given the night before medication.

(4) The dose of thallium acetate was given in sweetened water on an empty stomach in the morning.

The hair began to loosen in a few cases as early as the ninth day. The majority of the cases began to epilate between the fifteenth and nineteenth day with complete epilation by the twenty-second day.

After the administration of thallium acetate it is important to carry on further treatment as follows:

(1) Look for toxic symptoms.

(2) Have each patient wear a stocking cap to prevent the spread of infection.

(3) Daily application of an ointment such as 10 per cent sulphur or ammoniated mercury is used.

(4) The scalp is scrubbed three times a week with tincture of green soap.

(5) All broken off hair is removed by strapping the area with adhesive plaster and removing the plaster after a few hours.

Due to the rapid regrowth of hair after the use of thallium acetate, it is necessary to carry out the above treatment thoroughly.

In my series of 46 cases, 45 were boys and one was a girl. There were four failures, or 92 per cent cures. The ages of those not cured were five, nine, ten and twelve years. One patient aged five was given 9 mg. per kilogram of body weight and had incomplete epilation. Four months later he was given 9 mg. per kilogram of body weight and this did not cause complete epilation. Uruena, in his 612 cases, encountered nine thallium-resistant individuals. I classed this as a thallium-resistant case and did not attempt to re-treat. The cases nine and ten years of age had complete epilation, but due to the extensiveness of the disease and probably to reinfection from improper care, they were not cured. The patient aged twelve years, as described above, apparently was not given a sufficient amount of the drug to produce epilation.

CONCLUSION

(1) Thallium acetate has been used by ourselves and others in the treatment of ringworm of the scalp with successful results.

(2) Very young patients are more easily treated by this method than x-ray.

(3) Above eleven years of age thallium acetate should not be used because of its toxicity.

(4) In toxic amount the drug causes joint pains, inflammation of the gastrointestinal tract, hemorrhage in the liver, acute tubulonephritis, atrophy of the thyroid, parathyroid, suprarenal glands and testes.

(5) This toxicity increases with the age of the patient.

I wish to acknowledge with thanks the aid received from Dr. H. M. Weeter and Dr. A. D. Weatherby—Dr. Weeter for the weighing of the drugs and Dr. Weatherby for the observation of the patients.

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DISCUSSION (*Abstract*)

Dr. I. R. Pels, Baltimore, Md.—I wonder whether thallium acetate can produce changes in the skin such as we sometimes see following the use of the arsphenamines and of gold sodium thiosulphate.

Have all the possible methods of exhibiting thallium acetate been tried and exhausted? The apparent selective action upon the autonomic and sympathetic nervous systems would seem to open further fields of research, especially with regard to localized effects, and to degree of stimulation (or inhibition).

Is there any other drug that could be used in connection with this one? How far has research determined the possibilities of synergy (with other methods such as roentgen irradiation, and possibly other drugs) in effects upon the skin?

We know that a vast amount of work has been done with regard to the local effects of thallium acetate upon the growth of hair. And although it may be a platitude to mention it, it is not too extravagant to hope that on account of the incomplete selective action on hair growth, through oral administration, perhaps a method may be elaborated for using the drug by local or focal administration.

Experience with thallium acetate suggests continued and renewed study of drugs and of other agents which apparently exert a specific action on the adnexa and on other elements of the derma. It suggests, naturally, the search for agents which may exert a specific effect upon the sebaceous glands in the problem of acne, upon the sweat glands in hyperhidrosis and anhidrosis; upon the nails, upon the epidermal layer in pigmentations, dyskeratosis and ichthyosis. It directs more intensive attention to the pharmaco-dynamic excursions within an apparently mysterious and yet (to research) accessible field.

Dr. Thomas W. Murrell, Richmond, Va.—The ductless glands seem to possess an influence on the hair growth on certain sections of the body. The vortex and the outer third of the scalp are affected by the hyperthyroid state. I believe the loss of the outer third of the eyebrow is a classical sign in hypothyroidism.

Dr. Kelly mentioned the effect of thallium on the thyroid. I would like to ask the effect of thallium on basal metabolism, and whether the thyroid is affected permanently.

Has thallium ever been used by ionization?

Dr. Howard King, Nashville, Tenn.—I have been practising dermatology in Nashville, Tennessee, for seventeen years. Fifteen years ago Mook, in St. Louis, told me that in the Mississippi Valley he had never found it necessary to epilate the scalp for cases of ringworm; that they all got well following treatment with sulphur ointment. Up to that time, epilating the scalp with x-ray was considered a serious matter. Since then, I have never found it necessary to epilate the scalp in the treatment of ringworm except in three cases of favus. They have all gotten well with sulphur ointment treatment. I modified Mook's suggestion, however, as these cases when first seen usually present a certain amount of pustular folliculitis or kerionic formation. I adopted the plan of alternately using 12 per cent ammoniated mercury for two weeks and 12 per cent sulphur ointment for two weeks throughout the entire treatment. This plan has brought about a cure in an average of three months' time. Now, if this be true, with all due respect to the work of the essayist, why should we use a drug as toxic as thallium acetate in our section or in any other section of the South where the condition can be cured without epilation?

Dr. E. D. Crutchfield, San Antonio, Tex.—We were told that sulphur would cure these cases. I went back to Texas and tried it. We cannot cure them that way in Texas. So in casting around for a method of epilation we have chosen the x-ray and thallium.

Because of the toxic sequelae that sometimes follow thallium acetate in individuals who are past 10 or 11 years old, I believe that it is inadvisable to use thallium under conditions where x-ray may be used advantageously. It has no advantage over x-ray; and I take it that x-ray, as used in this day and time, has no particular danger. Where the control of the individual is difficult, where they do not lie still, in our experience I do not think we have had a failure with a dosage of 8 mg. of thallium per kilogram of body weight. I think that an interval of from nine to fifteen days is the usual time for the hair to begin to fall.

Dr. Kelly's point about taking care of reinfections is particularly well taken, because the hairs falling out carry with them many spores and reinfection is likely to occur unless one provides against it.

A local practitioner, upon receiving the usual advice to administer 8 mg. of thallium per kilogram of body weight of a child, weighed it on a drug store scale, with the result that the child developed intermittent claudication and eventually peripheral neuritis of the arms and legs, a condition which simulated pseudo-ataxia. The thallium must be accurately measured with a chemist's balance.

With children under nine years old Dr. Kelly has shown that ringworm of the scalp may be treated safely and practically by giving 8 mg. of thallium acetate per kilogram.

Dr. Lee McCarthy, Washington, D. C.—Dr. King's statement that he has cured most of his cases of ringworm with a simple salve containing salicylic acid and sulphur interested me very much. Sabouraud has contended that certain types of ringworm infection of the scalp are much more easily cured than others. The parasite that produces a marked pustular reaction in the tissue surrounding the hair follicle has a tendency to spontaneous cure. I remember seeing him demonstrate a case where no other treatment was used except hot poultices on the lesion, which was a kerion celsi due to a trichophyton neo-endothrix. This infection was entirely well in less than three weeks. The variability in the virulence of the different ringworm parasites may have a great deal to do with Dr. King's success, as these parasites may predominate in his region of the country.

We all know that, with the exception of favus, all ringworm of the scalp cures itself automatically at puberty. The only reason we treat these patients is to prevent infection of the surrounding children and to prevent destruction of the hair papilla, which would result in a permanent alopecia. For children in the pre-puberty period, I believe the mild form of treatment suggested by Dr. King is justified, provided we do not run the risk of infection of other individuals.

However, I agree with a large majority of investigators that ringworm of the scalp as a rule should be

treated by x-ray to cause epilation. This method is perfectly safe in the hands of competent men and is no longer in the experimental stage. At the present time as much cannot be said for the thallium treatment.

Dr. Richard S. Weiss, St. Louis, Mo.—Since Dr. King has broken the ice about the use of local applications in tinea infection of the scalp, I am not afraid to get up and say a word about it. We have been rather ridiculed in our use of salicylic acid and sulphur ointment in these cases. We see a relatively large number of small spore trichophyton infections of the scalp and we treat them all with 5 per cent salicylic acid and 10 per cent sulphur. With very few exceptions our results are cures in from three to four months of this treatment. I want to make this statement unqualifiedly: that they do get well clinically and microscopically and that we have been able to check institutional epidemics in the same way. I have read much of the literature about thallium acetate, but have never used the drug, because I did not feel it was necessary to subject these children to the risks that evidently are inherent in the treatment.

Dr. Kelly (closing).—This drug has been used about ten years. I have treated about 90 cases. Although it seems not to cause any damage now, it has not been in use long enough for us to know what harm it may do in the future, probably to the glands of internal secretion.

I know nothing of its being used by ionization.

I have obtained poor results from treatment by sulphur ointment and ammoniated mercury.

CHANGING THE BEHAVIOR OF THE MALADJUSTED CHILD*

By WILLIAM L. NELSON, M.D.,
St. Louis, Mo.

Behavior may be defined as the response of an individual to some phase of his environment which has a biological usefulness to him as an organism. Allport says: "Behavior in general may be regarded as the interplay of stimulation and reaction between the individual and his environment." To elaborate, we might say that it is an expression in the form of conduct that represents the functioning of a part or the whole of the human being as the result of motivations in association with previously applied stimulation.

The definition of behavior, then, implies a state of biological maladjustment from which in response to a stimulus the organism attempts to extricate itself in some mechanistic reaction.

The history of man's behavior is largely the history of mankind. As a preamble to all happenings of history stand many of the beliefs for which man has maintained exalted supremacy and succumbed to the onslaught of vicissitudes. Striving to understand himself he has espoused and discarded superstitious musings, theological dogmas and scientific concepts. Early in this interesting investigation man divided himself into two parts: a body and a mind. Superstition encouraged the belief that although man's conscious behavior and the reflex functioning of his somatic structures had some vague relationship somehow they were of a different nature and the so-called spiritual side of his behavior had little relationship to the more materialistic functions. Theological beliefs supported this conclusion. Metaphysicians and philosophers discussed it with little fruitfulness and out of the philosophic debate arose the opposing beliefs of the monistic and dualistic constitution of the mind. With the evolution of modern anatomy, physiology and psychology there is little doubt that the mind is represented in the function of the organism, and that behavior is the expression of the mind. This idea permits a belief in spiritualistic promptings because the organism is a living entity and is as spiritual as life itself. The vital tissues, internal secretions, and nervous energy are derived from cells whose constitutions are drawn from the very springs of life.

If behavior is the response of the individual to phases of his environment, it follows that it will depend to a great extent upon the condition of the organism and the nature of the environment that stimulates him. This involves on the part of the child not only a condition of physical well being, but an understanding of the situations that confront him and an evaluation of the experiences of life that will permit him to make an intelligent choice. On the part of the environment it implies an elasticity of demands in which rigorous decorum does not exact of him a narrow, stereotyped observance of dogmatic rules; where opportunity exists for the development of an expanding personality and where psychological freedom is the basis of relationship between him and those guiding him.

Opinions vary so much in regard to this very question and results are so uncertain that it is difficult for a great many to decide upon the thing to do. We often ask ourselves how much we are to treat the child and what we should do to change his environment. We find attitudes all the way from doing everything for the

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child to a radical reaction of doing everything to him in a disciplinary way.

To decide just how much should be done for him and to what extent we should go in altering his environment often taxes our ingenuity and involves more consideration than a great many parents are willing to devote to the situation.

How often do we hear opinions expressed as to remedies for changing the child's adverse conduct and how often do we see them fail?

Just recently this has been forcibly brought to my attention in the press reports of a young man 21 years of age who was brought to us five years ago by his father following a number of rather minor misdeeds. The boy was 16 years of age at the time and an examination of him revealed certain difficulties in his own outlook on life as well as defects in the disciplinary control to which he was being subjected. After a detailed analysis the situation was explained to the father and a program of treatment outlined. This the father did not adhere to. Not long afterwards the boy was involved in the theft of an automobile for some thrills, and driving across the Mississippi River into Illinois, he was apprehended under the Dyer Act. The father came to inform us about it and said, "Doctor, I just want to know whether the boy's mind is all right or not. If it is, that's all I want to know, for I am going down and ask that they send him to the National Reform School. They'll teach him not to do wrong there." He was committed to the reformatory for 5 years and released a few months ago. He returned to St. Louis and during those succeeding few months stated that he had held up about 150 persons in the community before he was again apprehended.

One person says: "Beat it out of them. Make them feel the consequences of their behavior." One father who consulted us some time ago was accustomed to beat his ten-year-old boy severely every time he caught him masturbating. He created such conflict in the child that his masturbation increased instead of decreased.

On the other side of treatment are those people who take an over-sympathetic attitude toward the child and want to excuse him for everything he does either because he was unduly influenced, is a poor little fellow or is just "mother's darling boy" and she can't bear to think of his doing anything wrong.

Those who have dealt at all extensively with misbehavior and have observed the effect of various forms of treatment understand the uselessness of repeated beating of children for misdeeds. Often instead of correcting the behavior of the child other difficulties are added. If inferiorities are not encouraged, a strong resentment is frequently established and the child sets himself out to avenge himself in greater misdeeds, hatred of those dealing with him or repetition of adverse behavior already established. This is the basis of the hatred of society by many of the adult so-called criminals, who, when they can be persuaded to discuss their feelings, give vent to their social animosities.

Neither can one accredit success to the attitude of condonement often adopted toward misbehavior. While in isolated instances such attitudes on both sides have been followed by cures, it is no more a rational method of procedure than to continue irrational methods of olden days in treating physical ailments, some of which recover in spite of the methods used rather than as a result of them. It is a recognized fact that much of the misbehavior of individuals, like physical ill being, is self-limited. Many of the acts of individuals are never repeated. The individual himself has such insight and strength of character that he sees and feels his mistake. It is not of these situations that I wish to speak, but the mechanisms that children have developed that are awry with social progress; attitudes that have been established or reactions that have been utilized, that are repeated and that are sure to lead to failure of the individual if continued: these are the conditions of which I speak.

We do not attempt to promulgate a fixed approach to the problem of changing the child's behavior. What we do want to advocate is that one cannot adhere to a narrow viewpoint. While we are far from conversant with the detailed nature of behavior, we believe that scientific endeavor does afford us a basis for saner procedure. As was stated earlier in this article, we have both the individual and his environment with which to deal, and just as the modern view in medicine in regard to ill health deals with both situations, so, too, in regard to social behavior we must consider what is basically wrong in these two sources. In physical ailments one rarely has to include other individuals as a source of treatment in correcting the difficulty, but in social maladjustment it is frequently others whose reaction or attitude impinges upon the child and influences his behavior adversely.

Thus we have:

(1) The child possibly impaired in his bodily health, but surely in his emotional and mental reactions.

(2) His environment. (a) Its physical proportions; (b) the social midst or people with whom he is associated, including members of his family.

It may be one or the other or all of these factors that contribute to his misbehavior, and we can deal intelligently with the situation only when we have examined carefully the conditions and can come to some definite conclusion as to what part each has played in the misbehavior. Such conclusions should come only after a careful analysis of the situation has been made. They should not be weighted with the emotional biases of those making the analysis and should not be hampered by preconceived ideas that have no justification in scientific pursuit.

Since the child is most directly related to the problem under discussion it is logical to begin with consideration of the child himself. First, let us consider whether or not there is anything in his physical make-up or personality that would interfere with his meeting the responsibilities that confront him. Does he lack energy, or are his emotional potentialities limited to such a degree that the task at home, in play life, at school or employment, place a demand upon him that is beyond his ability to meet? The point to be considered is whether or not there is bodily deficiency that would encourage the child to adopt some substituted means of meeting the exigencies rather than to face them squarely. This is often a factor in refusal to compete, deceit, dishonesty, running away, and so forth. If the standard of demand exceeds the threshold of ability on the part of the child an "easier" way of dealing with the situation is usually the result.

There are other physical conditions that act as sources of irritation or uncomfortable emotional states. Such conditions as poor and neglected teeth, adenoids, nasal obstruction, contribute to a general state of ill health that influences the character reactions of the child. While it is not claimed that these physical states are direct causes of the child's misbehavior, indirectly through excuses offered for him, indulgences, the establishment of a state of chronic ill being, their influence is felt. At times we as physicians impose a toll of abstinence from physical exertion upon a child and make no compensation for it when the child will in his enforced and authorized idleness often exert himself to far greater extent than he would if left to engage in moderate exertion.

This was plainly illustrated in the case of a fourteen-year-old boy who was under analysis some five years ago. He had been regarded as physically handicapped by a disabled heart by very able physicians. He had been denied the privilege of the usual activities accorded growing children. His time was not properly provided for and the substitutions in addition to being destructive to others involved much greater physical stress than the more active childhood games.

To what extent disorder or lack of balance in the endocrine glands contribute to the maladjustment of the child we are unprepared to state at present. A few of the more worthy observers want to attribute all the difficulties to the glands of internal secretion. However, there is no justification for the statement that they play an important part. As a matter of fact, we shall have to await further scientific research before a positive statement can be made.

In considering the possibilities of influencing behavior one cannot speak of such a situation without mentioning the so-called "neuroses." Since instability of personality is such a constant accompaniment of maladjustment, it is needless to say that any condition in the human organism that encourages instability will also add to maladjustment. In this category stand particularly Sydenham's chorea and encephalitis. Impulsions, fears, obsessions, much more readily graft themselves upon such vulnerable soil.

The accessions that confront the child at the beginning and through adolescence are recognizable many times as factors that need consideration in the maladjusted. The sexual feeling as well as abnormalities or arrests of development that may have begun long before adolescence demand recognition in order that appropriate treatment may be administered.

Taking up now the mental side of the child's make-up, we find implications that are of vastly greater importance than those of the physical side. This is largely because of the rather axiomatic statement made early in this article, namely, that the behavior of man comes from the mental side of his life. Our recognition of this fact makes all the more possible results from curative influences in dealing with the maladjusted.

We know how the feeble-minded and the frankly disturbed patient with mental disease may get into wrong doing and how, through a proper program of reconditioning, many of them may be redeemed from a life of destructiveness. Our own experience teaches us that a considerable per cent of the wrongdoers are limited in mental capacity according to mental tests. This does not mean that mental limitation is a cause of wrong doing, but rather indicates that society

has not arisen to its responsibility in the way that it deals with its mentally limited individuals, for such persons have the same potentialities for good behavior as the more highly endowed individuals. Aside from the mentally diseased, there is a much larger group of children who show poorly balanced and integrated personalities. Some of them show rather minor personality deviations, in some instances rather consistently and in others only manifesting themselves during periods of stress and unusual physiological activities. One cannot include all of them in the category even of psychopathic personalities. Many of them on analysis have brilliant mental capacities, but it is the emotional phase of their reactions that are at fault. To deal intelligently with them one needs to have a deep background of probing into the earliest and succeeding experiences of their lives.

This brings us to a consideration of the environmental side of their lives. The tendency to pass judgment upon both children and adults in regard to responsibilities and possibilities of readjustment without inquiry into their past lives seems to remain strongly with us. It should be a corollary to all psychiatric investigation that no conclusion be reached in regard to a human personality where maladjustment is being dealt with unless one has as an aid an extensive background of information pertaining to the individual's past experiences, his capacities and evaluation of his emotional feelings.

The home, the school, one's playmates and neighborhood conditions have made their contribution to the maladjusted child, and, if we are to give him the chance he deserves to become a useful citizen, it is necessary that we take full cognizance of these factors.

In changing the behavior of the maladjusted child we have many angles for investigation. Factors found in one situation will be lacking in another because the multiplicity of causes of misbehavior are as great almost as the number of individuals who misbehave.

But when the analysis has been made and one is able to conclude a program of treatment it is not always easy to carry it out.

While it is quite true that some children who are guided properly will establish good habits of bodily and mental activity, and with readjustment of their home conditions their behavior may change from adverse to favorable, in many instances the procedure is not simple. Often the great difficulty lies in being able to convince parents, relatives, school authorities or employers of the situations that have contributed to the maladjustment, or of the value of the procedure to be inaugurated. Parents, because of the feeling on their part of blame for the misbehavior on the part of the child, unwillingness to admit failure in training, reluctance to be separated from the child, will often refuse to accept one's contentions. Principals and school teachers, because of emotional biases and preconceived ideas in regard to the child, sometimes cannot cooperate in a plan of treatment.

I am mindful of the favorable relationship that exists between us and many members of the teaching profession, as well as the splendid response we have obtained from parents in dealing with the maladjusted children referred to us. But nowhere in the realm of human endeavor is that integration of character, that understanding of childish constitutions, that appreciation of human emotions as necessary as it is in those individuals who are shaping the lives and determining the destinies of youthful individuals.

Treatment, then, might be divided into two phases: preventive and corrective.

(1) Preventive treatment embraces a sound knowledge on the part of parents of the make-up of their children and an emotional integration in their lives that encourages comradeship, psychological freedom and is an inspiration to the child for the constructive, beneficial things of life. Mental hygiene has its greatest application in preventive medicine, for to build personalities correctly is of greater economic value than to raze an improperly constructed edifice and attempt to reconstruct it.

(2) *Curative Treatment.*—Often when misdeeds are in their incipiency they pass by either unnoticed or with little thought of their significance. Attitudes represented in the various social terms used to designate them, for example, stealing, lying, running away, feelings of inferiority, temper tantrums, or stammering, often have their origin in some personal experience or vivid association on the part of the child. Oftentimes one only succeeds in identifying the situation through most careful questioning of the child and this only under conditions where the child has confidence in the inquisitor's determination to protect him from the stigma of implication of others, the shame of being found out, or fear of punishment.

Knowledge of the circumstances under which the misdeeds are committed, for example, the time of day, frequency of recurrence, association and method of dealing with the individual committing misdeeds is needed.

Oftentimes the circumstances of the misdeeds suggest methods of treatment. For instance, if they occur in association with certain companions, at a specific time of the day, during idleness, the breaking up of undesirable associations through tactful substitutions, watchfulness and providing wholesome interests at the specific time of the day or making provision for idle moments will aid immensely in the program of treatment. Again, watchfulness and familiarity with what our children are doing, and dealing with their early misdeeds by investigating the motives that actuate them, is also essential.

In addition to specific remedies that one applies according to circumstances, treatment can be supplemented by creating a wholesome interest in various aspects of the activities of life. Here is where the recreational as well as the educational opportunities of a community may serve one. The various products of nature, topography, geological constitutions, the birds, flowers, or trees, can be utilized to develop a constructive interest that is not only informative but depending upon the proclivities of the child can be made most interesting.

The more directly recreational activities in the form of active and sedentary games with members of both sexes afford many opportunities for constructive employment.

Often the misdeeds come at a period of life when bodily activity means much to the child. Children like to do things, particularly things of a creative character that have a more or less manifest appearance. It is here that hand work with tools and various devices that permit the expression and representation of individual ideas is helpful.

It is extremely difficult to treat more than in a general way the changing of the behavior of the child in an article of limited time. However, an attempt has been made to intimate specificities as we have gone along. The reader can see embodied in the foregoing statements that two angles of involvement are always present: (1) those extraneous conditions of environment which influence the emotional life of the child in misdeeds; and (2) the inner life of the child expressed in his own subconscious or day-dreaming ideation that provides the impulse to misdeeds.

In discussing specific means of dealing with the child who misbehaves, the question of discipline and punishment has been purposely reserved for the closing words. There has been so much said pro and con discipline and punishment in the control of misdeeds that one has considerable reluctance to discuss them. However, such an article as this would no doubt be considered very incomplete without specific mention of them, so I shall endeavor in a few words to express my opinion of them.

That discipline properly administered has a definite psychological value I am thoroughly convinced, but that as ordinarily exercised it is inimical to that freedom of psychological response essential to sound character development I also believe.

The foundation of desirable character development implies self-control and self-discipline.

One desirable development is toward the control of the random impulsiveness that marks distinctly the behavior of the immature. At the same time, impulse is responsible for one's motivations and in the application of discipline care should be exercised that it not be nagging; that while it controls it does it as the result of education and that whatever emanates from the child as a part of its disciplinary training embraces a free expression of ideas and feelings.

Punishment is of a definite psychological value. Properly administered, both in spatial relationship to misdeeds and chronological development of the child, it is one of the best teachers we have. But when one recalls the circumstances under which punishment not self-inflicted is administered one recoils from the thought of advising it except to specific individuals on specific occasions. One must always take into consideration the reaction of the child toward it, and contemplate the child's actual need for it.

DISCUSSION (*Abstract*)

Dr. Carrol C. Turner, Memphis, Tenn.—I have had no experience with problem children or children of the maladjusted type. I expressed that view to Dr. Nelson and he insisted that I make the attempt to discuss his paper, and I began to realize I have this advantage over him: I am the father of three children, all of whom I think are maladjusted.

It seems to me we can consider a maladjusted child, although this is in conflict with Dr. Nelson's belief, from a basis of endocrinology. I have a patient in

mind whose development was such as to create physical inferiority which resulted in a defensive attitude towards his fellows, his playmates, and a very intensive maladjusted behavior; so much so that he is almost a complete Bolshevik towards society.

In considering the maladjusted child it also seems to me that we should consider parental influences, and as Dr. Nelson suggested, the management of the child means the management of the parents. We see parents whose bahvior is such that we almost expect that behavior in the offspring. They refuse to consider that their insufficiencies are the cause of the maladjustment of the child. Dealing with these patients is most difficult when it seems that the technic of such treatment should be applied to the fountainhead in the parents themselves.

Dr. H. R. Unsworth, New Orleans, La.—I think it is unfortunate that mental hygiene has almost entirely forgotten not alone defective biology, but the possibility of organic conditions producing misbehavior reactions.

It is well known that a person develops psychologically on three different levels, namely: the mechanical, intellectual and social. It is possible for a junior personality to be deficient on any one of these three levels or any combination of them. As Dr. Nelson has brought out in this particular case, the child may be especially adept mechanically as well as intellectually, but socially, it is apparent that he is deficient.

I further feel that it is unfortunate that the public schools, the public clinics, social agencies and social clinics have so concentrated on the formative mind in a child.

There are very definite periods of development in which a juvenile personality gradually seeks its own care and protection from the outer world. It is true that an only child for instance, of very apprehensive or over-indulgent parents, may be retarded in his ability to take care of himself on account of much protection.

A normal personality will usually develop normally, in spite of detrimental environment, if it is allowed a reasonable opportunity to do so.

It is particularly interesting to note in the history of adult psychoses the geneology of the patient. In most instances a deficient biological make-up supplies the etiology of the later psychoses.

I feel that a more profound study of organic conditions in juvenile misbehaviors will most often explain their anti-social development.

During a recent survey in Louisiana, made by myself, of several hundred school children who were reported mentally retarded, the explanation was found in many instances to be basically organic, being predicated on definite diseased conditions. Where these pathological states were corrected, most of the children improved in their school work.

It is my opinion that much misbehavior is predicated not alone on defective biology, but on organic nervous diseases, for example, chronic encephalitis and epilepsy.

Dr. George B. Lake, Chicago, Ill.—In dealing with many of these patients, we are going far afield if we continue to hold the older idea that the brain secretes the mind, in the way that the liver secretes bile. I am more and more convinced that William Allanson White, of Washington, is correct when he speaks of the mind as "the most complicated and delicate organ of a man." The mind is definitely an organ, to the activities of which the brain merely gives expression.

The idea of segregating the sexes, it seems to me, is entirely erroneous. We have emerged from the Middle Ages, when monasticism was considered a very proper thing; we are living in another century and, at least as humanity is now constituted, we are living in a country which consists of men and women, and any adjustment which does not prepare an individual to move about comfortably and happily in such a world is an inadequate and unsatisfactory adjustment.

Dr. Turner's suggestion regarding the endocrine factor, and particularly Dr. Unsworth's, seems to me to be getting afield from the direct line of this paper. Dr. Nelson was not talking about feeble-mindedness, but about social maladjustment. Of course a feeble-minded person is maladjusted socially, as is the man who is obviously deficient physically; the cripple who is born without feet or arms, or the man who has lost those members by accident later in life, cannot adjust himself normally and satisfactorily. He has to make some special types of adjustment.

In the feeble-minded child we can almost always find some physical disease, generally associated with the endocrine glands.

I want to add one more line of development to Dr. Unsworth's three categories. I would add to the physical, mental and social the moral age of the individual. A child may be socially not feeble-minded, but uninstructed. We do not call a child of five feeble-minded because he cannot deal with the problems of an adult. It is a question of time and instruction.

The biologic factors in these cases can be objectively demonstrated. We can demonstrate the man who has lost a foot or whose thyroid is not functioning; but those of us who have dealt with psychic problems are well aware of the fact that we see many patients who have the most painstaking physical examination, without showing any physical abnormality whatever, and yet who are completely out of touch with their social environment, so much so that life is a misery.

It is possible to lay too much stress upon the organic phase of maladjustment when we are dealing with a psychic problem. Mind and emotions work together; and when they do not work harmoniously with the psychic activities of the people with whom the individual is surrounded, disaster results.

Dr. Nelson (closing).—We have always a condition of biological unrest that prompts behavior. If the organs were at rest there would be no stimulus.

We have not been able to demonstrate changes taking place in the nervous system that permit behavior, nevertheless it probably happens that they are there. In other words, the question of nervous system change or nervous system participation in behavior probably carries with it a certain change going on that we have not been able to demonstrate. The fact, however, that we cannot demonstrate it should not make us content and undesirous of finding conditions that sponsor behavior.

I do not want to say that the endocrines have not some influence upon behavior.

Freud went back to the prenatal life of a child in order to save his theory of determinism and concluded

there were maternal impressions left upon the child that became a part of the condition of that child. He reasoned that everything that exists in the child's subconscious has to exist previously in the conscious, so he had to go back to prenatal influences in order to save himself with that theory. Probably there are prenatal influences. Certainly we have them from an organic standpoint in the question of syphilis and many other things. We do not recognize certain deficiencies in the life of a child, and therefore after birth the child is subject to the same repertoire of experiences and he fails because he has not sufficient responsive structures to enable him to compete with another individual.

There is no reason in the world for a feeble-minded individual to be socially maladjusted, if society recognizes its duty. That is a broad statement, but I will adhere to it. In the first place, if we recognize the deficiencies in the child early in life we are going to compensate for them. After all, what is the significance of life? Of what value are the things that happen in one's life? In the first place, the child learns by having experiences and assimilating them; that is, we learn by doing and constructing meaning from what we do. We usually repeat those things that give us satisfaction, and if we appeal to the better feelings of the child we are sure to get more significant behavior from him. One thing that must not be forgotten is that we must be sure the child is able to grasp the situations in which he participates and see to it that the manner of securing experiences for him permits of psychological freedom in participating in them.

THE GENERAL PATHOLOGIST AND THE BRAIN TUMOR PROBLEM*

By CHARLES PHILLIPS, M.D.,†
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This is to be a frank discussion of a situation met today in medical centers when with increasing scientific knowledge there is increasing recognition of the fact that brain tumors are more frequent than was formerly thought. If they are diagnosed, we are next faced with the question of what to do with the unfortunate patients. The natural complexity of the problem of operative relief apparently is still keeping neurological surgery a rather limited specialty, but even the number of these practitioners is increasing and as they achieve added skill more tumors will be operated upon. Already we know that brain tumor is not necessarily as hopeless a condition as was formerly thought, and so tissue from these cases is bound to come to pathologists in greater abundance. Now the pathologist of general training has usually had little opportunity to handle this work and so neuropathologists have been developed in a few places and in general most of us have been satisfied for them to take care of this work. This mutual division of labor does not always hold.

The natural complexity of surgery of brain tumors is matched by a somewhat artificial complexity of their description due primarily to the fact that there was so little material formerly available for study that no one pathologist had seen enough tumors to be able to use diagnostic terms generally acceptable. Of course we have had for a long time obvious anatomical terms of classification like pituitary, pineal, meningeal, blood vessel, glial and metastatic tumors. These terms could not be permanent in a day of research and so from many parts of the world there have been writings on the subject, with increasing complexity of nomenclature. Authority in medicine is a relative thing and for some years we have lacked uniformity in classification. This may be illustrated by a recent experience of the writer who, in describing a tumor having the well known tendency of gliomas to show perivascular arrangement, found a half dozen terms used by experienced workers for the same process and diagnosis. The uncertainty of nomenclature was increased somewhat several years ago when from Cushing's Clinic there appeared the results of splendid study and research on the largest group of gliomas ever reported. The complicated technic used was troublesome and often unreliable and the adding of new terms certainly for a time made trouble for the general and even the neuropathologist. Gradually a simplified classification is developing.

The experience of the writer is typical in this field, for he has come to the present position by gradual development in the field of general pathology without special training in neuropathology. Right here let it be said that we recognize the breadth of this specialty and are limiting the present discussion to the handling of intracranial growths. The writer found that one of his duties was the handling of a fairly abundant material of this nature and that the training of a general pathologist was hardly adequate for the present situation. The indications were clear and treatment obvious. Like others in similar need, we have gone through special stains of complicated technic, have read

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widely and followed the lead of others of large experience. Being a teacher of pathology as well as a tissue diagnostician for an active neurosurgical service, we have protested constantly against the addition of many new terms to an already unsatisfactory classification of brain tumors, at the same time recognizing the need for much study and research, which often leads to an entirely new viewpoint or even a complete new set of terms. Gradually our own material has accumulated to a point where it has seemed of value to study it again in the light of present developments.

The intracranial growths here described have been selected from a little over six years' material coming in to the Department of Pathology of the Medical College of Virginia, most of it from the service of Dr. C. C. Coleman, of the Department of Neurological Surgery. This falls into two natural divisions, depending upon its source, from surgery, from autopsies. In a few instances a patient having an operative specimen has come to autopsy here and so the story was closed, but the case counted but once. A good many have had several operations over months or years. Only verified tumors are included in this study. Any neoplasm of intracranial growth is accepted and classified. Gliomas have a notable tendency to have associated cysts and the neurological surgeons insist that often there is a prominent nodule of tumor tissue inside which if gotten and examined will reveal the true histological character of the process. In this reported series a cystic case is called a cyst unless we have had enough tissue to clinch the diagnosis.

The extensive experience of Cushing and Bailey with gliomas was followed in the choice of histological methods and classification until gradually it was found too lengthy. Many of the terms used by them seem to be representative of distinct and constant histological types and are still used by us. At present we have dropped back into the routine use of three staining processes, hematoxylin and eosin, Mallory's phosphotungstic acid hematoxylin, and anilin blue. Perdrau's method for connective tissue reticulum is striking and reliable, but not always necessary. Simple fixation in neutral 10 per cent formalin or Zenker's solution is found adequate, followed by paraffin or celloidin technic. At present the degree of differentiation of the cells is regarded as the most important basis for classification. The least differentiated and most rapidly fatal glioma is that one called spongioblastoma multiforme. The most differentiated and most favorable type of glioma is called the astrocytoma which frequently is associated with cysts. Between these we find histologic types for which the terms medullo-epithelioma, medulloblastoma, astroblastoma are used. There are a few unclassified because of insufficient material. In many gliomas there is marked variation in cell types and we select several blocks and use a final descriptive term truly representative.

Pituitary tumors in this series are adenomas and a doubtful adenocarcinoma. Borderline growths are difficult to classify histologically.

Blood vessel tumors here are angio-endothelioma, hemangioma and one called by the last term from Cushing's Clinic, hemangioblastoma. We are not sure of this term and confess uncertainty about its use. We find that the angio-endothelioma is different in structure and probable origin from the meningeal endothelioma called meningioma, and use the former term to designate definite vascular endothelial relations.

The endothelioma here is the same process called meningioma, arising from meningeal tissues and resembling a fibroblastoma in cell types and staining reactions. In general it is encapsulated and benign, but several cases here have been recurrences and malignant.

The neurofibroma or acoustic neuroma is a rather definite tumor in location and structure. Some of our cases histologically resemble well differentiated gliomas and without reference to the clinical course and operative findings are hard to classify.

The metastatic group are carcinomas from other parts of the body and an interesting glioma of unclassified type which apparently originated in the orbit and metastasized to the meninges and, oddly enough, to both ovaries of the patient, a small negro girl.

There are several sarcomas of probable meningeal origin with bone involvement as presenting features. One of these is strikingly perithelial in arrangement and might be called a perithelioma or perithelial endothelioma, but we have chosen the old and stable term, sarcoma.

In the miscellaneous group are found a malignant pinealoblastoma, a diffuse round cell sarcoma of the basal meninges, an angiosarcoma with metastases to many parts of the body, a cholesteatoma of the fourth ventricle.

Not included here because not intracranial neoplasms of man, there have been two gummas, a tuberculoma of the cerebellum, several cord tumors, an intracranial osteochondroma in a dog, all occurring in the same period reviewed.

The following table shows a simple condensation of the foregoing data:

Glioma		
Spongioblastoma multiforme	14	
Medulloblastoma	13	
Medullo-epithelioma	2	
Astroblastoma	9	
Unclassified	6	
	—	Per Cent
Total	49	50
Endothelioma	13	13.02
Angio-endothelioma	5	5.01
Neurofibroma (acoustic neuroma)	14	14.02
Pituitary adenoma	3	3.06
Pituitary adenocarcinoma(?)	1	1.02
Hemangioma	1	1.02
Hemangioblastoma	1	1.02
Sarcoma (meningeal?)	4	4.06
Metastatic tumors	4	4.06
Miscellaneous		
Cholesteatoma	1	
Angiosarcoma	1	
Pinealoblastoma	3	3.06
	49	50.00
Total	98	

From the above it will be seen that in our service one-half of the intracranial neoplasms are gliomas; the other half are divided among ten classes. There are five types of gliomas listed here and it may be possible to reduce their number still further so that instead of using descriptive words we might do as is current now in carcinomas, and grade them into four convenient grades. The very malignant spongioblastoma would then be Grade IV, the astrocytoma Grade I, with the other two grades divided properly. A fuller discussion of this is reserved for another paper soon to be completed. So to grade gliomas would be in line with the tendency toward simplification of classification and the general pathologist, after practice, could use three simple stains or even two, and probably arrive at a working scheme somewhat like that given here.

There is one point that needs stressing here. If the general pathologist is going to have to handle brain tumor material such as the writer has had, he should know more neuro-anatomy and histology, he should cultivate close association with the clinical side of the problem and apply his common-sense and fundamental knowledge of histopathology to the task. While this type of diagnosis is difficult and material comes to most of us in small amount, if this simple report counts for anything it shows that a general pathologist without special training in neuropathology may acquire ability to handle the brain tumor problem in scientific fashion.

SUMMARY

The writer is a general pathologist and teacher of pathology in a medical school, who was somewhat dismayed at first to find that his duties included certain neuropathological responsibilities. He tackled the problem as any one would and finds after six years' experience that it is not so difficult after all. A brief classification of 98 intracranial neoplasms is presented. A tentative suggestion is made that we might consider a system of grading of gliomas like that in use among carcinomas, but this idea is fairly obvious. The study and research of others is extremely valuable and fundamental to any discussion or analysis of brain tumors today and is deeply appreciated by the writer.

DISCUSSION (*Abstract*)

Dr. John A. Lanford, New Orleans, La.—My experience with brain tumors has not been nearly so extensive as has that of Dr. Phillips and I have therefore not had the opportunity of seeing a wide variety. The fact that there is a great variety of cells in the central nervous system, and especially in the brain, will explain the wide variety of cellular elements in the neoplasms of the central nervous system. Until the extensive work of Drs. Cushing and Bailey there had been no really workable classification available, but since the publication of their various articles and their text book we are able to classify these neoplasms more intelligently, especially with reference to surgical treatment and prognosis.

Dr. Phillips has shown that the endothelial cells present a variety of histological pictures. We consider the function of the endothelial cells in the central nervous system under two headings: to cover structures as illustrated by the dural endothelium, and to form vessels as illustrated by blood channels. Neoplasms springing from either type of these endothelial cells would produce a structure mimicking their parent origin, and it is possible to see neoplasms springing from endothelial cells behaving in either of the two forms.

Neoplasms springing from the endothelium of the vessels are rarely, if ever, localized, but since they do not metastasize, if they can be completely removed without too much destruction of tissue, the patient will recover. The endothelial neoplasms springing from the dural endothelium are practically always benign in that they do not infiltrate and do not metastasize, and surgical interference in such types of neoplasms usually offers favorable prognosis if the location is accessible. Both types, however, are always looked upon as being malignant by position. It should be kept in mind, however, that the dural form of endothelioma may show infiltrative tendencies. I had an opportunity many

years ago to see such a dural endothelioma that had infiltrated the bones of the skull and the overlying scalp.

Dr. Phillips (closing).—I have presented this paper merely to show that a general pathologist (and I want to insist that I am not a neuropathologist) can, if he has abundant material and simply sticks at it, diagnose these tumors with some success. The process is not absolutely so difficult as it has seemed through the writings of recent years.

THE TRAINING OF COUNTY HEALTH DEPARTMENT PERSONNEL*

By J. H. JANNEY, M.D.,
Indianola, Miss.

There is no doubt that the full-time county health department is the most effective instrument which the science of preventive medicine has developed for meeting the health problems of the rural area and small city of this country.

Those of us actively engaged and interested in county health work are keen to see new counties take on units and existing departments improve in efficiency. This desired progress in quantity and quality is directly dependent upon the type of individual selected to fill the position of health officer, nurse, or sanitary inspector. Those qualifications which are essentials of efficiency in any task adopted as a life work must be possessed to an unusual degree by staff members of a good county health department. They include as most important, integrity, energy, sound judgment, ability, interest, personality, and knowledge of one's job.

In selecting personnel it must be remembered that integrity, energy, and personality are inherent qualities of character; that interest and ability, if latent, may be developed; and that sound judgment and knowledge of the work must be acquired through training and experience. Although age has not been mentioned, it is obvious that the individual taking up public health for the first time after middle life is most certain to be seriously lacking in some of these essential qualifications.

State health officers have always experienced an extraordinary difficulty in manning their county health units. The underlying reasons for this difficulty have been discussed many times and need not be repeated here. The past five years have brought improvement, but until salaries are more attractive and tenure of office dependent upon merit, the difficulty will continue to exist. County health work in a few states is being handicapped by the apparent necessity of extending political patronage. Undoubtedly the explanation of the mediocrity of some county units is to be found in the bartering of staff positions for the county appropriation. County health work will continue mediocre just as long as local units are used as a haven of refuge where physicians too old to practise medicine may, on a modest salary, pass their declining years in political security.

State health departments select local personnel on the basis of medical training and experience, personal interview, and references. Until some five or six years ago health officers, nurses, and inspectors were placed without preliminary training, or at best after a few days spent in observing the work of a unit already functioning. Newly organized units with inexperienced staffs usually floundered about for the first six months and lost valuable time and money before the personnel discovered through experience just what is meant by rural public health work. The training station is an effort toward avoiding this period of inefficiency, and in addition, it serves the not always seriously considered function of appraising the prospective health worker as to his fitness for a county position.

It is of interest at this time to present briefly a few observations regarding the only training station with which the author has had experience, namely, that at Indianola, Mississippi, maintained by the State Board of Health of Mississippi, the Sunflower County Health Department and the Rockefeller Foundation cooperating. The Station was established in July, 1927, as an attempt to meet the demands for trained personnel which resulted from the impetus given county health work in the South by the overflow of that year.

Up to September 1, 1930, 119 health officers, 171 nurses, and 158 sanitary inspectors have spent from one to seven weeks at the Station for purposes of training and appraisal. Mississippi, Arkansas and Kentucky have sent 77 per cent of these candidates. Louisiana, Georgia, South Carolina, West Virginia, Virginia and various other states and foreign countries supplied

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*The observations on which this paper is based were conducted under the auspices of the Mississippi State Board of Health and the International Health Division of the Rockefeller Foundation.

the remainder. State health officers select the candidates and request the Rockefeller Foundation to authorize the training. If this authorization is granted the candidate receives from the Foundation his traveling expenses to and from Indianola and a daily stipend to cover living expenses during his stay at the Station. The per diem stipend for health officers is $5.00, for nurses and inspectors $3.00.

Table 1
DISTRIBUTION ACCORDING TO STATES

State	Health Officers		Nurses		Sanitary Inspect's		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Mississippi	19	17	51	31	43	30	113	27
Kentucky	24	21	68	42	31	21	123	29
Arkansas	25	22	30	18	35	24	90	21
Louisiana	15	13	7	4	25	17	47	11
Georgia	11	10	4	2	1	1	16	4
South Carolina	7	6	—	—	—	—	7	2
West Virginia	6	5	1	1	—	—	7	2
Other states	7	6	1	1	10	7	18	4
Total	114		162		145		421	

During the past two years certain modifications in the course of training have been brought about. The period of training is now six weeks. Groups of not more than five health officers, six nurses, and four sanitary inspectors are admitted every six weeks. With this plan in force it will only be possible to provide training for seven groups during the coming year. Candidates are required to report promptly and to remain for the full period of training. The purpose of the course is to develop the community point of view of public health, to instruct as to the theory and technic of the fundamentals of county health practise, and to appraise the candidate as to his future possibilities. More than sufficient instruction to enable the prospective worker to size up his local health situation and begin a sane attempt at the solution of his most important problems is not undertaken. If he is fitted for his job he will find that experience is his most valuable teacher.

Immediately upon arrival at Indianola all candidates begin a rural sanitary survey, the field work, tabulation of data, and report of findings and recommendations, which require about five days for completion. Each individual writes his own report and these reports are taken up and discussed in detail at a general round table conference. For developing the public health viewpoint, and giving a clear idea of county health work, there is nothing in the course more valuable than this sanitary survey.

Inspectors are then assigned to field work with the local sanitary inspector and except for attendance at lectures and a day or two on sketch mapping, spend the remainder of their time in the field gaining practical experience in sanitation.

Nurses and health officers spend two days on study of the health department's method of collecting, recording, filing and tabulating births and deaths. Practical exercises in calculating vital statistic rates and in making simple graphic representations are performed. The remaining time is spent largely in observing and taking part in the routine activities of the Sunflower County Health Department, which, according to the season of the year, include school, preschool, tuberculosis, immunization and prenatal clinics, communicable disease control, and home visits. At intervals throughout the course informal lectures and conferences are held on such subjects as the economics of public health, state and county health organization, communicable disease control, public health education and sanitation.

At the expiration of the course a confidential report is written on each candidate and sent to the state health officer who requested the training.

Certain data regarding 114 health officers, 162 nurses and 145 sanitary inspectors who have passed through the Training Station have been tabulated and present facts which may be of interest.

Table 2
DISTRIBUTION ACCORDING TO APPRAISAL

Appraisal	Health Officers		Nurses		Sanitary Inspect's		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Good	56	49	80	49	61	42	197	46
Fair	41	36	58	36	59	41	158	38
Poor	17	15	24	15	25	17	66	16
Total	114		162		145		421	

Of the health officers, 49 per cent were classified as good prospects, 36 per cent as fair, and 15 per cent as distinctly poor. Seventy-eight per cent spent more than four weeks in training, but only 24 per cent six weeks or more, and most of these were trained in the last two years. Fifty per cent of the health officers were

beyond the age of forty and 33 per cent more than forty-five. Of the 37 health officers beyond the age of forty-five, 32 per cent were good and 68 per cent were fair or poor. Of the twenty beyond the age of fifty only 30 per cent were judged as good. By way of comparison it is interesting to note that of the 56 below the age of forty, 64 per cent were classed as good and 36 per cent as fair or poor. The training of 56 per cent of the health officers cost more than $200.00 each.

Table 3
DISTRIBUTION ACCORDING TO AGE

Age Group	Health Officers		Nurses		Sanitary Inspect's		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Under 29	27	24	99	61	86	59	212	50
30-39	29	25	51	31	27	19	107	25
40-49	40	35	11	7	26	18	77	19
50-59	15	13	1	1	4	3	20	5
60-69	3	3	....	....	2	1	5	1
Total	114		162		145		421	

Of the 162 nurses, 49 per cent are classed as good prospects, 36 per cent as fair, and 15 per cent as poor. Fifty-four per cent of the nurses spent more than five weeks in training and 33 per cent six weeks or more. Thirty-one per cent of the nurses were below the age of twenty-five and 78 per cent were below the age of thirty-five. Fifty per cent of the nurses cost more than $150.00 each to train.

Table 4
DISTRIBUTION ACCORDING TO DAYS IN TRAINING

Days	Health Officers		Nurses		Sanitary Inspect's		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Under 13	6	5	5	3	7	5	18	4
14-20	9	8	12	7	10	7	31	7
21-27	10	9	25	15	17	12	52	12
28-34	34	30	33	20	46	31	113	27
35-41	27	24	34	21	26	18	87	21
42 and over	28	24	53	34	39	27	120	29
Total	114		162		145		421	

Forty-two per cent of the 145 sanitary inspectors are reported as good, 41 per cent as fair and 17 per cent as poor. Forty-five per cent spent more than five weeks in training and 27 per cent were at the Station for seven weeks or longer. Fifty per cent were below the age of thirty and 71 per cent under thirty-five. The cost of training inspectors was under $150.00 each for 60 per cent of the group.

Table 5
DISTRIBUTION ACCORDING TO COST OF TRAINING

Cost	Health Officers		Nurses		Sanitary Inspect's		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
$ 99 or less	6	5	18	11	15	10	39	9
100-$149	13	12	62	38	73	50	148	35
150- 199	31	27	61	38	50	35	142	34
200- 249	31	27	15	9	4	3	50	12
250- 299	24	21	6	4	2	1	32	8
300 or more	9	8	....	....	1	1	10	2
Total	114		162		145		421	

Obviously the only possible method of judging the results of this process of training and appraisal is one involving a survey of those who have passed through the Station. It is unfortunate for all concerned that this recheck has not been possible. Information regarding the present status of those who have taken training at Indianola, or any other training station, would be of untold value not only to state departments of health, but also to those actually responsible for the teaching. The Indianola Staff feels that improvement could be brought about if state departments would take an active interest in the Station. Criticism and visits are constantly asked for, but rarely received. It is difficult to do a piece of work when results go unmeasured, and those being served make neither adverse nor favorable comment. The training of personnel is an important factor in the conduct of county health work, and should be studied sufficiently to enable at least an approach toward standardization.

CONCLUSIONS

It is evident that the hoped for progress in county health work will be brought about chiefly through improvement in personnel. The selection of an individual for a staff position should be dependent upon his ability to meet a high standard of necessary qualifications. The training he receives before taking up his work, although essential, is secondary in importance to his qualifications. Although it is impossible to say definitely what measure of success has been achieved by the Station at Indianola and other similar stations, it is believed that some good has been done, and at least a serious attempt

is being made to meet a need. Courses of training should certainly be made more effective if state health departments could take a more vital interest in the task which confronts the Training Station.

DISCUSSION (*Abstract*)

Dr. W. S. Leathers, Nashville, Tenn.—There can be no question that the training station has supplied a very definite need in the preparation of personnel for county departments of health as well as for other phases of health work. The essayist stressed the full-time county health department as being the most important mechanism for the prevention and control of disease. I should like to reenforce this idea by stating that the establishment and extension of the all-time county health departments is the most constructive step that has been taken during the past two decades in supplying an adequate health service for the rural population.

There are a few points in the paper of Dr. Janney which I wish to refer to particularly. The first of these is the necessity of having some plan or policy for selecting the personnel of health departments and particularly those who are employed in local health service. This is of the greatest importance in securing persons who are properly trained and it is also of value in obtaining the cooperation of the medical profession. A well-trained nurse or health officer is certainly more competent in getting the cooperation of a physician than one who does not know or who has not had the experience of determining just what approach is most effective in mobilizing practitioners of medicine in the development of a local health service.

The state health officers are beginning to appreciate increasingly the need for some system in selecting a better type of public health worker. The time is coming when there will be a more definite policy on the part of state health departments in this connection. One state health department has already adopted the policy of selecting county health officers, nurses and sanitary inspectors who have received a certain amount of training in cooperation with the university. There can be no doubt about the soundness of this principle and I should like to see all of the state health departments adopt some definite plan in maintaining this principle in public health administration.

Another point which Dr. Janney mentions is the fact that the men who receive training in the Station with which he is now connected have in a large majority of instances been successful, but it is gratifying that he classifies them so that a certain percentage are designated as "poor." If a physician who wishes to become a health officer goes to a training station there should be an understanding with the state health officer of the state from which he comes that unless he receives the kind of rating which is satisfactory he will not be used in that state, nor should he be employed in any other state in this phase of medical service. In other words, unless training is used as a basis for determining who should be chosen by state health officers, it seems to me that the system fails. Unless state health departments have certain requirements for the selection of personnel it will be difficult to get physicians, nurses and inspectors to avail themselves of the training necessary for such work.

Sometimes unfortunate methods are used in the selection of personnel. It seems that these undesirable methods may be the outcome of an overanxiety to obtain adequate appropriation for the local health department. It is perfectly obvious that such a procedure will result in failure, and no health department should countenance a policy or method that is not conducive to permanency. The health officer must work with men in public positions, but this does not mean that he should not guide their thought and influence for the thing which is best in the establishment and administration of public health organization. I have no sympathy whatever with any procedure which is not based upon the sound scientific conception of health work. It is my experience that if such a principle is consistently followed one will accomplish a great deal more in the long run than by short cut and questionable methods in the establishment and organization of local health departments or any other phase of health work, as for that matter. The health officer should oppose any political influence which is not in accord with best thought and experience in the administration of public health work.

In conclusion, I wish to state there can be no question that the field training station as conducted has served a useful purpose. We need to continue these training centers at least for the present. I hope in time this will result in a more intensive and systematic course of training in universities which are in a position to give graduate instruction to physicians, nurses and sanitary inspectors who wish to enter the field of public health as a career.

Dr. Allen F. Murphy, Beckley, West Va.—I spent three weeks with Dr. Janney and I have never had a chance to tell him how much I appreciated it and how much I received from that training. I learned many things in Indianola, Mississippi. One thing which I copied from the Sunflower County Unit was the making of monthly narrative reports. I believe these have done more to publish our work in our County than anything else. Some health officers with whom I have talked seem to think them a waste of time. True, you do not get anything from them nor is any good accomplished, but if you do not tell people what you are doing you will not get anywhere. I am glad of this opportunity to thank Dr. Janney publicly for what he did for me in Indianola.

Dr. Douglas L. Cannon, Montgomery, Ala.—A recent article quotes the Secretary of the Interior as saying that the average community spends about $40.00 per year for the education of each of its pupils and less than 40 cents for the protection of life. I am of the opinion that when there is adequate personnel properly trained for service in county health work their efforts will lead to a happy medium between these two rather wide extremes.

The Alabama Field Training Station has three objectives:

(1) To train new personnel.

(2) To afford further training to employed personnel.

(3) To pursue scientific investigations of administrative importance.

The importance of a station as a culling point should not be overlooked. Since July 1, 1930, there have been ten health officers in training. Out of the number

there has been a mortality of 35 per cent. I think it is better to have the weeding done during training rather than after the individuals have assumed charge of a county. Serious consequences often follow changes in personnel.

Dr. F. Michael Smith, Vicksburg, Miss.—Many nurses and many inspectors have served and passed through the health departments which I have been privileged to direct. These helpers I have endeavored to instruct. Many of them have been successful in public health activities. A few have proved misfits. Often, in earlier times, when one got nurses who had had previous experience, perhaps had done some Red Cross work, they seemed to be the greatest misfits, inasmuch as their bent was social welfare work rather than preventive medicine. It is a wonderful opportunity today for a health officer, nurse or inspector going into public health work to have the opportunity of even the small amount of training offered at our training schools. A wonderful amount of instruction is given in the short period of time of this course. Of some ten or twelve nurses that I have had work with me who were in part trained in our health department, I have had only one who came from a training station. This nurse more readily took up the work, executed it more satisfactorily and had a more comprehensive grasp of what it was all about, and we have felt that she came to us better prepared than we possibly could have prepared her in a similar time.

Dr. Janney (closing).—I hope this paper and these discussions will stimulate interest on the part of state health departments in the solution of this problem. We at Indianola appreciate the kind things which have been said about us, but we regret that when people have constructive or destructive criticism to offer they do not give us its benefit.

WHY TERMINAL CANCER?*

By S. S. MARCHBANKS, M.D.,
Chattanooga, Tenn.

So many persons among our population are dying of cancer that the question arises in my mind, "Why are we letting them die?"

The public is being well educated by the various organizations for the control of cancer; in fact, the laity is becoming quite alarmed at the increase of the incidence of malignant disease and in many instances is demanding proper examination. As a rule, the laymen know, too, when they are not properly examined. Further, it is notably true that the profession as a whole is not prepared accurately to diagnose, and even less to treat, cancer.

The chief reason is that most of us are marking time while waiting for the other fellow to discover the cause and a "one shot" cure.

While the public is becoming more and more interested, it has not yet arrived at the point where it can be separated from enough money to supply the seriously needed hospitals for cancer work.

It is believed that the fact that we do not know the specific cause of cancer is largely responsible for the failure to raise money for hospitals. Donors are usually financiers, and when the medical men on committees trying to raise funds cannot show that they know the whole story, the financiers are not willing to hand out money to be spent in an indefinite manner. The laity simply cannot see the problem through the eyes of the physician.

I shall make a few remarks upon the cause of cancer in order to establish a working basis both for the purpose of information for possible donors of hospitals and for the purpose of getting on with a program of treatment while waiting for a fundamental discovery.

What is cancer? Since the time of Virchow cancer has been more and more recognized to be a result of chronic irritation. Ewing states that cancer is not a single disease, but a great group of diseases of different causation and course, and that it is most unlikely that a single cause and one specific treatment will ever be discovered.

We know that tumor growth must be a fundamental thing, but there is no proof of the nature of malignant proliferation of tissue cells. Neither have we any definite knowledge of the nature of normal growth. As was said before, instead of waiting for sensational discoveries we had better use the knowledge we have.

Quigley states the cause of cancer interestingly as follows:

Acidity is one of the requisites to the development of the cell proliferation we call cancer. The mechanical effects of traumatism interfere with proper circulation of the blood and proper drainage of lymph.

This stagnation invites the activity of microorganisms in the fluids present. The fluids which were feebly alkaline or at least neutral now become acid.

In the presence of the proper degree of acidity and irritating microorganisms, the cell explosion takes place. In a recent report from the Pasteur Institute (November, 1927) it is stated that acidity exists as high as pH 6 at the mar-

*Read in Section on Radiology, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

gins of infected areas. This line of reasoning seems to explain carcinomas which develop in the internal parts of the body, such as hypernephroma of the kidney. In malignant tumors of the breast and in sarcoma we nearly always get a history of trauma and in case of no direct injury, mechanical interference with circulation, such as thrombosis or embolism, may be the local contributing factor. This puts the etiology of malignancy on a basis of germ irritation, plus certain contributing factors incident to the part of the body attacked.

Keeping these things in mind, we may work out a protective etiological regime looking towards the prevention of internal as well as external tumor growths.

Cancer is a new growth of new cells in some particular area of the body, not under control of any body laws. It is independent and the growth is continuous, so that it may eventually exceed the limits of the original area and invade surrounding structures.

Cells constitute the units of a living organism and each cell does some useful work in the community of cells we call the body. Cells may grow in response to the demands for increased function, for example the blacksmith's muscle, the increased size of one kidney after excision of the other, the filling in to normal proportion of an area destroyed or removed by accident, or bits of skin, mucous membrane or even small parts of organs that fill in by the natural repair mechanism of the body. This new growth of cells differs from cancer in that it attains a certain normal growth and stops. Why?

Because these cells are, like all functioning cells, controlled by nerves. Cancer cells grow continuously and without law or limit because these cells have no nerve supply or, one might say, an unorganized or undifferentiated nerve supply.

The thing that causes previously normal cells to start on a wild orgy or multiplication is irritation. Normal physiology of cell life is directed to two things: function and reproduction. The cells may be thought of as having a reproduction center and a function center. Under the stress and the strain of repeated insult to groups of cells and bad living conditions for the cells, the power of reproduction becomes the dominant factor in the cell life until the time comes when all the physiology of the cells is directed toward reproduction and no more useful work is done. It will continue to reproduce (self-preservation).

Now, this irritant exists for a relatively long time, and the irritant that leads up to the development of the disease we call cancer must be one of these four:

(1) Mechanical irritation.
(2) Chemical irritation.
(3) Thermal irritation.
(4) Infection.

The first three are predisposing causes, infection being the immediate cause. The irritants break down the normal defenses and allow the entrance of microorganisms which produce the direct irritation to the cells, leading to an exaggeration of the repair mechanism.

As cancer grows in every organ and tissue in the body, and as different localities in the body harbor germs of various kinds, it is evident that cancer is not produced by any one germ, but that any germ or parasite that may localize or colonize in any part of the body may produce the necessary irritating toxins and set in motion the chain of events that eventually becomes cancer.

Cancer then results from germ irritation, and as the number of different kinds of germs likely to be implicated in the process is very great, the folly of treating cancer with vaccines or serums will readily be seen. In the struggle for existence among the cancer cells, only those are fortunate that happen to be near blood vessels, not the ill-formed haphazard new-formed blood vessels of the new growth. These cells, near normal blood vessels, get plenty of food and grow rapidly, pushing their masses into every nook and corner possible, following the line of least resistance, until the various projections into the normal tissues come to resemble roots, and are so called by the laity. They are eagerly growing cells drunk with toxins, exuberantly extending themselves where they are well nourished, in a mad riot of growth, invading, breaking down barriers, paying no attention to the border lines, only interested in one thing, reproduction. There are crazy blood vessels produced by crazy cells, so that they fail in their duty, except in a very haphazard way. In tumors that grow very slowly, an attempt at producing all three coats may be evident in the blood vessels, but in rapidly growing tumors only the inside one, or intima, is present. The demand for blood is so great that the structural changes cannot keep up with cell growth and

the vessel pushes on with only the endothelial lining.

There are three zones concerned in the nourishment of the cancer mass. These are the reasons for radiosensitivity:

(1) The advanced guard, composed of invading cells nearest the normal tissues, and getting its nourishment from the normal blood vessels of the normal tissues.

(2) A little farther back, the mature cancer cells getting nourishment by chance from the imperfect blood vessels built up in the tumor itself.

(3) Cells still farther back from the advance guard, getting little or no food, and going through all the different degrees of starvation, disintegration and death.

Germs are found in all three of these zones, but on account of its lack of resistance they are very plentiful in the third zone among the dead and dying cells; and here the greatest amount of poison and the most virulent poison is produced.

In the onward march of eagerly growing cell masses the fragile walled lymph vessels are places of low resistance. Consequently they are in due time plugged with cancer material. As all rapidly growing cancer material has relatively little connective tissue, and is, therefore, brittle, little plugs are broken off and detached from the main mass and become like a seed floating in a stream, the larger lymph vessels containing millions of such floating emboli. There is a constant movement in every cancer mass.

So then, if acidity, mechanical irritation, thermal irritation and infection are the causes of cancer, it is up to us to put up an organized effort to prevent these causes.

We might discuss, if time allowed, the distribution of cancer among the species, the topographical distribution, racial distribution, heredity, age, internal secretions, immunity, habit, occupation, marital state, economics, and diet, but all these must be passed at this time, though it might be in order to mention a statement of Dr. Pack to the effect that there is no region, nor continent, nor climate where the human race can seek immunity. There is no one race, nor nationality, nor type of individual with cancer immunity which might eventually populate the earth.

Ewing says that quite a fascinating tale could be told of the influence of heredity in human cancer, but the best opinion today is to the effect that all human beings are rather susceptible to cancer if exposed to the right forms of chronic irritation. He says that very few of us have a very strong tendency to cancer. Heredity, therefore, cannot stand in the way of cancer prevention.

The ideal of cancer prevention can never be materially approached until the profession and laity both become thoroughly excited about the subject and cause the appropriation of funds for a sufficient number of institutions to receive and treat properly the ever-increasing number of these unfortunates.

The statistics are appalling: over 100,000 cancer deaths per year in the United States, cancer now ranking second on the list of causes of death, heart disease being first. Among the causes of death among females cancer is first. From the standpoint of economics, cancer is now the most important of all causes of death.

The personal habits of the individual which are more or less necessitated by the stress and strain of modern civilized life are the principal factors tending to produce cancer. However, moderation, temperance, simple life, and physical examinations once a year at least, say on birthdays, will go far toward prevention.

It is the consensus of opinion among those who have made a study of the facilities the world over for cancer service that a very definite improvement in the service must precede any substantial progress in cancer control. The people need to know, also a very large percentage of the profession needs to know, that at the International Meeting on Cancer Control at Lake Mohonk it was agreed that the only treatment so far justified by experience and observation depends upon surgery, radium and x-rays.

The introduction of new methods of treatment has transformed the field of cancer therapeutics from a comparatively simple series of standard operations into a highly complex question of choice involving deliberate conference between the surgeon, the pathologist and radiologist, all of whom should be familiar with the whole field of cancer therapeutics in general and with their own specialties in particular. In other words, the surgeon should know enough tissue diagnosis and radiotherapy to appreciate their true value and the same rule holds good

as to the relation of the other two. These three, assisted of course by all other branches, can give the best service only when they can work in properly equipped institutions and hospitals. With the cooperation of surgeons, pathologists and radiologists we have been gradually working out our difficulties, but against great odds. It has been too much of an individual fight, that is, we should have had and still need many more clinics and hospitals with material and equipment, particularly for the pathologist, because it is impossible to have trained pathologists unless they can have the inducement and proper facilities to study tissue pathology, grading and radiosensitivity. Another reason why we have not enough tissue pathologists is that they are not sufficiently supported in private practice, and hospitals do not pay enough to interest graduates in taking up pathology. There are a great many young men who might have been star pathologists who have taken up other more remunerative lines.

In 1928, an investigation was made as to the status of the average cancer service in the United States, 19 cities with a population of 100,000 to 1,000,000 being checked. It was found that, aside from skin cancer, cancer of the breast was considered to be the most potentially curable type. There were found to be five times as many breast amputations as resections of parts of the alimentary tract, although the incidence of alimentary tract cancer is four times that of the breast. This illustrates the lack of information and training.

Further, it was found that most of the radiologists were men who had taken up cancer treatment after having been roentgen diagnosticians, and that very few had much clinical experience and fewer still had training in pathology, though they were generally good x-ray diagnosticians. They saw wide variations in the methods of x-ray and radium therapy, also that the hospital accommodations were fair so far as standard surgical procedures go, but there was almost no provision for the advanced cases. In many instances the cost of surgery and radiation was a cause of delay in seeking treatment, resulting of course in development of advanced and inoperable cancer.

Follow-up systems were found to be negligible and no service is complete without a live follow-up system.

Most hospitals had fair laboratories in charge of able men, but the number of cases of cancer which they saw was not enough to allow them to become good tissue pathologists and the so-called country districts had far less facilities.

At the present time the cancer service of this country is being furnished by 19 skin and cancer hospitals and institutions: 12 in the East, 3 in the North, 2 in the South, and 2 in the Middle West, in addition to the service supplied by the general hospitals. The bed capacity of these 19 skin and cancer hospitals totals only 1,203 as compared with 4,268 general hospitals with a bed capacity of 357,034. There were only 1,203 beds to handle the 100,000 patients who died, plus around 25,000 who are estimated to be cured per year. Of course, the general hospitals are caring for the others in an unorganized fashion and only for short periods as a rule, the patient necessarily having to be taken home for convalescence. There are 1,203 beds for fighting the principal cause of death, economically speaking.

Nervous and mental hospitals are growing faster than all others combined. It is estimated that by 1934 there will be one-half million inmates of nervous and mental hospitals. Ninety-three per cent of the counties in California have hospitals, but there is no record of a single skin and cancer hospital according to American Medical Association statistics.

Dr. James Ewing with Drs. Greenough and Gerster, acting as a committee for the American Society for the Control of Cancer, recommend that cancer service in the United States be organized as follows:

(1) Cancer institutes.
(2) Special cancer hospitals, state, municipal, university, and private.
(3) Organized cancer service in general hospitals.
(4) Diagnostic service in general hospitals and dispensaries.
(5) Diagnostic laboratories.
(6) Licensed physicians, surgeons.
(7) Cancer homes.

A recent newspaper article states that Dr. Ewing recommends about six institutes strategically situated and costing about $10,000,000 each, two or three being government owned.

These institutes are desired to cover the whole field of service as concentration centers, while the special cancer hospitals are simply small institutes, so to speak, in affiliation with the larger institutes and serving the next smaller

divisions of population. These institutes should have:

(1) Facilities for both private and charity patients.
(2) Departments headed by full-time specialists in all lines with complete diagnostic, operative, and radiological equipment.
(3) Staff conferences.
(4) Complete records.
(5) Social service and follow-up system.
(6) Education and instruction for undergraduates and those physicians referring cases. Also, courses of instruction for pathologists, physicists, and experimental workers.
(7) Special training for nurses in the cancer field.

The special cancer hospitals should, as far as possible, follow the organization and activities of the institute.

The general hospitals and dispensaries should have no less than a group composed of specialists in pathology, surgery, medicine, x-ray and radium, gynecology, genito-urinary diseases, eye, ear, nose, throat and skin diseases, and with facilities for at least diagnosis and treatment, and with a head to supervise this work, since here the cancer cases would be scattered through the hospital. The dispensary would treat only the minor forms, referring the majors to the hospital with which it is affiliated.

The Diagnostic Laboratories.—Here much depends on the ability of the pathologist, for mistakes are serious obstacles to the successful treatment of cancer. It is recommended that material be sent only to such laboratories as are known to be provided with experienced tissue diagnosticians.

The Function of the Unattached or Private Physician and Surgeon.—The general practitioner is not usually trained in cancer work largely because there are not enough convenient training institutions, yet he is the key man in cancer control. The average case goes first to the family physician and there is usually not much that he can do in the way of treatment, but he can take prompt action to see that the patient is referred to those experienced in such work. The number of cases which the average physician sees in a year is small; however, he should know, and see that his patient knows, that the first definite treatment which a cancer patient receives usually determines his fate. "Try and try again" will not work, and for this reason no surgeon or radiologist should undertake the treatment of major cancer unless he has affiliations which will enable him to deal with the many complications and sequelae that occur in the later course of the disease. The surgeon should have had special training or experience in cancer surgery and the radiologist should not attempt cancer work unless he is acquainted with the diagnosis and clinical course of cancer and is equipped with suitable apparatus and knows the proper dosage.

Lastly, cancer homes can render important service only when they have quick access to the equipment of the special hospital or its equipment. Even so, it would seem difficult to maintain the morale where many hopeless cases are assembled. It is possibly best to do all that can be done in the institute or hospital, and then send the patient home under observation of the follow-up system.

So far all of the so-called "one shot" cures, including the recent flurry on the West Coast, seem to be accomplishing nothing of importance. Therefore, the sooner organized medicine gets behind a program to provide cancer treatment consistent with the knowledge we now have, namely, on the basis that irritation is a cause, the sooner the death toll will be cut down. If the war on the white plague was an eminent success, why can it not be the same with malignancy?

SUMMARY

(1) It is largely the public's fault that there are so many terminal cancers, because it has not supplied the profession with institutions and equipment for their eradication.

(2) Until a fundamental discovery is made, the cause of cancer should be thought of as due to irritation.

(3) There will have to be a very great improvement in the diagnosis and treatment of cancer before any substantial progress is made in cancer control, and this service cannot be supplied until the profession is better educated and until the public is still better educated and last, but not least, until there is a flood of educated dollars for the service.

(4) As to treatment, the people need to know that the consensus of opinion of those authoritatively informed is that the family physician is the key man, that we emphatically must get the cases earlier and that the only treatments so far justified by experience and observation are those given by surgery, radium and x-ray.

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DISCUSSION (*Abstract*)

Dr. C. H. Heacock, Memphis, Tenn.—The infectious theory of cancer production brought out by Dr. Marchbanks is very ingenious, and probably as good an explanation as any. However, it should be borne in mind that all explanations of cancer at the present time are theories. They are all based on experiments and in most cases represent a good deal of time and money.

It may be estimated that 10 per cent of the human race falls victim to cancer in one way or another. It would seem that surgery has reached its maximum efficiency in working out this problem. Surgery alone can cure about 15 per cent of all cases, and radiation may take care of another 15 per cent. If you combine radiation with surgery it may be a little bit more efficient, but after we total this, it leaves an appalling loss of 60 to 70 per cent of patients with cancer for whom there is no cure at the present time.

As long as we have this condition people are going to die of cancer, and we are going to have terminal cancer. Whether we can do anything in the way of cure of these patients, we certainly ought to consider the patient.

Probably all we can do is make them comfortable. I think it is well to bear in mind the paper that Dr. Uhlmann, of Santa Barbara, wrote a few years ago, suggesting an attempt to maintain the proper balance between alkalis and acids in these patients.

You will notice in the report to the American Society for the Control of Cancer, quoted by Dr. Marchbanks, that considerable emphasis was placed upon the diagnostic side, and that is very important, because we know that a good bit of the benefit we hope to accomplish will be in the way of early diagnosis. In some cases, of course, no matter how early we diagnose cancer we cannot do much with it, but that is the generally agreed method by which the death rate will be decreased. This program which the American Society for Control of Cancer laid out is bound to be very slow in being put in operation, because it is very expensive. If you will notice the exhibit of the American Society for the Control of Cancer among the scientific exhibits, you will see that there are only five states that have the program in force, and there are 19 states in which there is no hope of putting this program in force at any time during the near future.

According to the map there are only 14 cancer therapeutic centers in the United States, and most of them are in New England and the Middle Atlantic states. There are only four of them, I think, in the territory of the Southern Medical Association. At the present time there are only two hospitals in the South with one gram or more of radium, and only four hospitals with 200 milligrams or more, showing there is a great deal to be done, and that it is going to take a long time to put this program into effect. But even when it is in effect, the main responsibility, I think, will have to rest upon the man who sees the patients first. These patients do not consult the organization put up by the American Society for Cancer Control to begin with, and these conditions must be at least suspected and directed toward the proper sources if we are going to accomplish very much.

As Francis Carter Wood wrote in a recent article published last month in the *Journal of the American Medical Association*, "It is useless to educate the public unless the profession can meet the demand so stimulated, and the profession cannot do so unless the facilities for under-graduate and post-graduate instruction are advanced beyond their present constitution. Even if this development does take place, it will be useless unless the profession sees its opportunity and uses it to its value; then, and then only, will there be any hope for the cancer situation."

ADVANTAGES OF A HOSPITAL ASSOCIATION TO A RAILWAY COMPANY AND ITS EMPLOYES*

By R. J. WILKINSON, M.D., F.A.C.S.,
Huntington, West Va.

It has been my privilege to be intimately associated with an active railroad hospital association for the past fifteen years, and during this time ample opportunity has presented itself for the study and appreciation of its advantages to both employer and employe. Since an interdependence between the employer and employe is necessary for the proper functioning of such an institution, it would seem advisable to refer to it as a mutual association, an association that has primarily for its aim the advancement of human happiness. When it is properly managed and allowed to keep abreast with the modern advances that are being made in medicine and surgery, it returns a large dividend to its investors.

The necessity for an organized medical department to railroads, as well as to other large employers of labor, that has for its objective the conservation of health and the furnishing of proper curative measures, is being more and more appreciated.

First, it is a proved economic investment for the company, because any measure that conserves the man power must necessarily be reflected in the yearly statement. Again, statistics compiled by many leading industrial concerns show that a healthy, happy employe is rarely injured, while it is an accepted fact that a sick employe, whether he has a mental or

*Read in Section on Railway Surgery, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

physical incapacity, is a potential danger to himself, his fellow workmen and to the company for which he works. The hospital association is instrumental in providing both health and happiness. Through its modernly equipped hospitals, not only is relief given the employe, but by the easy payment plan and a greatly reduced hospital charge service is dispensed to dependent members of employes' families. This, of course, relieves a mental anguish that necessarily exists when sickness appears and there are no funds with which to provide the best professional and hospital care.

Second, the advantage of having injured employes treated in a railway hospital is most apparent because these hospitals are prepared to meet all types of emergencies. They have a competent trained professional staff and the necessary hospital equipment. I believe the period of disability is materially lessened when patients are treated in an institution of this kind, and, unquestionably, they are better satisfied than when confined in private hospitals among strangers. This statement is not in any sense meant to reflect upon the private institutions, for in most instances they are doing a great work; but their small capacity is reflected in the overhead expense which often prohibits the employment of specially trained physicians and the necessary diagnostic and therapeutic equipment.

When this type of hospital first came into existence there was considerable opposition on the part of the medical profession. They believed that contract medicine, or rather employment of physicians on a salary basis, was contrary to medical ethics and that they should be debarred from medical organizations. However, conditions have changed within the past few years, for now the profession recognizes the importance of such institutions. They have been recognized, of course, on account of the splendid work they are performing and the type of professional men who make up their staff. In this connection I refer you to a recent editorial appearing in the *Journal of the American Medical Association*, October 25, 1930. Only recently the American College of Surgeons, recognizing the need for more training among our general surgeons in treating industrial cases, appointed a committee of prominent surgeons to study conditions regarding this type of patient. Their report is most enlightening, for it senses the need for more trained industrial surgeons and even goes so far as to recommend that the medical colleges include in their curricula a course on industrial surgery. This study further revealed that patients treated in hospitals that meet the College requirements are not confined nearly so long and the results are uniformly better. In this connection may I state that most association hospitals meet this requirement. It might be interesting to mention that the statisticians of the College found that common wounds caused loss of time to 3,250,000 workers annually, and that the cost incident thereto reached the enormous sum of $104,000,000. I believe these figures are indicative of the tremendous economic problem that employers of labor must help to solve.

As you no doubt are aware, railroads are most reluctant about furnishing figures as to the cost of treating injured employes for any given period. This is not unreasonable when one considers the fact that a comparative study might be very misleading, for the type of injury must be the basis for the expenditure. However, I am reliably informed that it cost one large railway system with an active hospital association twenty-nine cents for each thousand dollars gross revenue received in treating injuries and paying damages, while with another company without such an organization the cost reached the enormous figure of one dollar and twenty-six cents for each thousand dollars received. This startling discrepancy must be reckoned with, and to me it seems the hospital association is one of the deciding factors.

Lastly, I believe all large industrial organizations are becoming more and more convinced of the importance of close cooperation with their employes, because the company has a definite investment in each employe, an investment that would be hard to estimate in dollars and cents. The hospital association with its subsidiary activities, of which I will speak later, offers one of the best avenues for this contact. It is an association that is mutually beneficial and based primarily on humanitarian motives.

Considering this subject from the employes' side, I am thoroughly convinced that the average man readily appreciates the advantages a hospital association offers and is interested in seeing a further development. During my fifteen years of close association with the employes of the Chesapeake and Ohio Railway Company I have yet to hear an employe complain that the assessment was too high, while on the other hand the majority insist upon a higher deduction if it means better service. The high cost

of sickness that has recently been stressed by laymen in several of the weekly and monthly periodicals brings strikingly to our attention the precarious position in which the average daily wage earner finds himself when sickness befalls his family. The pauper is provided for by city, county, and state; the wealthy man can select his physician and hospital without regard for the cost, but the wage earner cannot raise the necessary money for this service without resorting to some loan company whose excessive interest rate precludes the possibility of this debt's being paid for many months, or even years. These writers have stated or strongly insinuated that the medical profession and hospitals were charging excessive fees for work performed. They have rather put the burden of caring for the working class on the physician by advocating a cheaper hospital charge and a lower fee for professional services. As a matter of fact, the physicians have been forced to build hospitals without financial assistance from the community served, hospitals that represent a cash investment, and it is only reasonable that they should demand a fair return. In a recent article entitled "Dollars and Disease," by Dr. Walter E. Vest, President of the West Virginia State Medical Association, these writers are taken to task. He conclusively proves that the average physician earns less than $6,000 annually, notwithstanding the length of time spent in preparation and the enormous cost incident thereto. This author agrees that the honest working man faces a tremendous problem in raising money for sickness, but in view of the large amount of charity work performed by the average physician each year, he discharges his obligation to society; therefore, the question of relieving the working man should rest with the individual and the company for which he works. A physician's training is his capital stock and it is only reasonable that he anticipate a reasonable return on this investment. During the last decade the cost of professional fees has increased 50 per cent, the cost of all living commodities has increased 68.4 per cent, and at the same time the average man's earning capacity has increased approximately 100 per cent.

The employes of a railroad who have a functioning hospital association are indeed fortunate not only because of the high class service offered them by a trained staff in the event of injury or illness, but even more because of the service to their dependent loved ones. Again, the advantage of a hospital association to the employe is indelibly impressed upon us when we think of laboring men and women who have no protection in the event of sickness or injury when not on duty, and if injured while at work their only recourse is a state compensation commission. The treatment offered these individuals is often inadequate on account of the ridiculously small fees allowed for both hospitalization and professional work, while the compensation for time lost or permanent disability is not sufficient in most instances. Occasionally we hear an insinuation that the railroad receives most of the benefit from an association. However, it must be obvious to the intelligent employe that an association cannot hope to exist without the cooperation of the company. The deduction from wages that is handled gratuitously by the company is the only possible way in which the finances of such an organization can be successfully managed. In addition to this expense, which is considerable, the company provides the hospital buildings and not infrequently is called upon to advance financial assistance. The only possible return to the company is obtained when an injured employe is treated without additional cost, but in this connection it is well to remember that injuries sustained by employes on duty represent considerably less than 5 per cent of our patients in both the hospital and out-patient department.

After carefully studying the various methods employed by our leading railway systems in dealing with their sick and injured employes, one is amazed by the wide difference of procedure. All should be and are striving for the same objective, namely, conservation of man power. I often wonder whether the railway executives and labor leaders have given this matter careful consideration and honestly attempted to solve this rather complex problem.

The average relief plan now in force on many leading railroads fails to measure up to the highest standard. It falls short of supplying all the essential things necessary in the life of the average railway employe. The medical departments of most railroads have not kept pace with other branches of railroad development, and there must be and is a reason for this. In the first place, the management has been interested primarily in the conservation of the machine power and has overlooked the man power which is of paramount importance. Again, the chief surgeons and others of the medical departments have been selected as part-time men with in-

adequate salaries and not infrequently a mistake is made by appointing one of the operating executives as head of the medical department. It seems perfectly obvious that this work requires a man who can devote his entire time to the development of this important branch of railroad work, one who is peculiarly fitted, personally, for personality is most essential, and professionally, because he must deal with every known medical problem.

We are all familiar with the splendid work that is being done for "Safety First" and appreciate the results that are being obtained, but these efforts can never reflect their true value until we can by a rigid semi-annual physical examination for employes and a pre-employment examination bring our personnel to the higher physical standard. However, this plan can never have the support of laboring men until through some mutual understanding they are assured of a living even if they are found to be physically incapacitated to perform the duties to which they are accustomed. It would seem that this can be accomplished by the adoption of a relief system like that which is now operated by many of the large railroads or by a group insurance plan that will afford employes protection whether injured, sick, or pensioned. In either event, the plan should be sponsored by the employes and given assistance by the company. It would seem that the hospital associations or relief groups are the organizations to sponsor such a move, since their governing bodies consist of both labor leaders and railway officials. One of the first steps in accomplishing this reform is through an educational program, one that will convincingly bring home to the employe the advantage of a semi-annual physical examination.

Any plan that is mutually beneficial should be amicably handled by the company and employes without entering into a contractural relation that might become embarrassing to either side.

Further, it would be far more equitable if funds for our association or relief systems could be deducted on a percentage basis rather than by the method now in practice. Our plan of deduction ranges from a minimum of eighty cents to a maximum of two dollars per month. By this one can readily see that employes earning from $100 to $200 per month are the largest contributors, when, as a matter of fact, they are the ones who can least afford to pay hospital bills and professional fees. Last year the thirty thousand employes on the Chesapeake and Ohio Railway contributed $339,000, whereas a 1 per cent deduction would have shown a return of $540,000. It can be seen that this additional revenue would provide, among other things, a tuberculosis hospital, one that is accessible to the employes and members of their families. At the present time most associations are allowing approximately one dollar per day to these unfortunate tuberculous employes and they are entering state sanatoria when vacancies occur, but, as a matter of fact, they should not be required to wait. When a semi-annual, or even an annual examination becomes, as it will, a factor in the lives of railway employes we can expect a tremendous increase in the number of tuberculous patients who will need hospitalization. Again, this amount of money would make it possible to have a home for incurables and pensioned employes, a home that is most urgently needed by all railroads.

Finally, the association should, through a trained public health physician, carry on a disease prevention campaign not only among employes, but among their families as well. This can easily be accomplished by cooperating with the railway company and with the health organizations in the various municipalities, counties, and states through which the railroad runs.

The employes' magazine that is published monthly by most railroads should be the medium through which to reach the employe and his family. Therefore, every issue should devote considerable space to the medical department, so that matters vital to the health of employes can be freely discussed.

In conclusion, may I not urge that while attempting to solve the problems which involve the health of employes that a committee representing the boards of our hospital associations, relief systems, or other railroad medical organizations meet annually to study these questions? This study, if wholeheartedly entered into, can be constructive and react to the advantage of both employe and employer.

A hospital association, relief department, or both is either a good or bad investment. If bad, the whole plan should be abandoned, but if

there is merit in either then an honest effort should be made to attain the highest development.

May I take this opportunity to express my sincere appreciation to the chief surgeons of the different railroads for their splendid cooperation in furnishing me data regarding their individual medical departments?

DISCUSSION (*Abstract*)

Dr. A. R. Rozar, Macon, Ga.—Having been connected with a railroad before the organization of its hospital association and since then, I have been able to observe the advantages it has offered to the employes. In the beginning they were rather skeptical; however, they are now very enthusiastic in their praise of the hospital association.

Dr. Wilkinson brought out a point I would like to emphasize. It seems to me that the deduction should be in accordance with the salary received, and on a percentage basis.

Dr. William A. MacMillan, Charleston, West Va.—The railway hospital today is the shelter, not only for the employe of the railroad, but for his family.

The railroads look upon the hospital with a great deal of pride from a prophylactic standpoint. Their annual examinations or semi-annual examinations are a great means of preventing disaster to their most valuable employes, the engineers.

The system adopted by the railroad hospitals today has proven that much embarrassment in time of sickness can be removed. Their patients are satisfied guests of the institutions.

The success of a hospital depends upon the personnel of the institution.

Dr. J. M. Emmett, Clifton Forge, Va.—Dr. Wilkinson and I are associated in the Medical Department of the Chesapeake and Ohio Railway.

Our Hospital Association was organized in 1897. An agreement was reached between the railroad and the employes by which the railroad company was to build and equip two hospitals, one at Clifton Forge and one at Huntington. The employes, by deductions from their wages, were to operate both institutions.

The Hospital Association is directed by a governing board composed of nineteen members, ten of whom are selected from the labor organization and nine of whom are supposed to be appointed by the railroad.

In addition to our two regular hospitals we have a group of annex hospitals, probably six or seven in number, situated at various points along the railroad where there are large groups of men employed. We feel that our Hospital Association is rendering a very definite and necessary service to our railroad employes and to the members of employes' families.

OUR MIDWIFE PROBLEMS*

By WALTER EDMOND LEVY,
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New Orleans, La.

The superficial observer will reason that one of the earliest functions of the race was childbirth, and deduce that along with centuries of scientific development this phase has attained a standard parallel to the present grade of civilization and proportionate to the discrimination of our intelligentsia. Few laymen stop to consider that to this first childbirth the savage gave little or no assistance, but gradually the practice of calling neighbor women to assist became common. The third step was the banding together of these women to form a class whose business it was to assist in parturition. Naturally there was no scientific background, no knowledge of physiology, pathology, or anatomy to rely upon, so the methods of these women were founded on experience, and no little part of their practice was comprised of superstitions, charms, incantations, and invocations to special deities.

What consternation ensues, then, from the bald statement that a class of women on this same pattern exists at the present time: that in European countries the midwife is a fixed element in the social and economic systems, and that in the United States 30 to 40 per cent of all confinements are in her care? Certainly, then, if the world is to be made a safe place for the mothers of today and their progeny, who cannot be safe in the hands of ignorance and incompetency, it is time for the medical profession to insist that the step-child of medical science be taken into the fold and accorded the necessary care which has been lacking. The erroneous opinion has been prevalent that pregnancy is but a normal process of nature, unneedful and unworthy of the utmost attention.

Many general practitioners consider attendance in parturition disagreeable, and therefore tolerate the midwife as a necessary evil, and make little pretense to concern themselves with her practice. It is due largely to this indifference that the mortality attending childbirth has

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*Read in Section on Obstetrics, Southern Medical Association, Twenty-Fourth Annual Meeting, Louisville, Kentucky, November 11-14, 1930.

*From the Department of Obstetrics, Touro Infirmary and Tulane University.

been increasing for centuries. One need not be sagacious to realize that the modern mother has greater cause for fear than the primitive woman, for she is the prey of civilization, of mongrelization, and of diseases subsequent upon the present mode of living.

Since the situation is so universally vital, it might be well to go to the root of the trouble. In the United States available statistics for the year 1927 show a mortality rate in the puerperal state of 13.7 per 100,000 and 55.2 in early infancy, only slightly better than figures of the previous year of 14.3 maternal and 58.2 infant mortality. A short time ago the Department of Commerce in Washington made public statistics for the year 1929 of the Registration Area, which includes 97.4 per cent of the total population of this country. The report states that the rate of mortality for infants under one year of age was 68 per 1,000 births. Eleven states had lower infant mortality rates than at any time since their admission to the Registration Area, but twenty-one states had higher rates. This latter fact the department attributed to the infant mortality among the negro population, especially in rural districts. It is among negroes that the midwife is most used and is responsible for ghastly pictures of distressing complications. The negro midwife is frequently old and superstitious, disregards sterilization and scientific procedures in preference for the ignorant traditions of her race, and deems her prerogative to be based upon what she terms a "calling from de bressed Lawd." In spite of the parrot-like knowledge with which this generation is steeped by health departments, delivery among the blacks in this country is found to have many of the horrors depicted by Katherine Mayo, in "Mother India."

Furthermore, the United States is the Mecca for the amalgamation of nations, which in turn produces social and economic conditions responsible for the employment of midwives. The records of a large New York hospital showed that the nationality of most of the midwives there is foreign: first Italian, next German. Among the patients it is the Italians again who largely demand the services of the midwives, followed by a great percentage of foreign-born patients. We are told that in Texas each Mexican woman is a potential midwife.

Our medical profession is dealing, then, with a bulk of patients whose finances do not often permit the payment of a physician's fee. Adjustment is, therefore, difficult. With a view to gathering pertinent data, a questionnaire was sent out to a number of Southern states, inquiring the status of affairs, and their precautionary regulations. For the most part the information gained is inadequate, for many states fail even to license the women to whom they intrust the lives of this and the next generation. The points covered by the questionnaire were:

(1) Total number of deliveries year by year for the past ten years
(2 a) Number attended each year by physicians
(b) Number attended each year by midwives
(3 a) Percentage mortality of infants in 2 a and 2 b, and causes thereof
(b) Percentage mortality and morbidity of mothers in 2a and 2b and causes thereof
(4) General attitude toward midwives and requirements for a license
(5) Remarks

In Texas the condition is claimed to be a perplexing one for which neither the medical profession nor the State appears to have a solution. The letter from the State Health Officer, J. C. Anderson, M.D., of the State Department of Health in Austin, is herewith quoted verbatim:

"Referring to your questionnaire, I wish to advise that Texas had a very imperfect system of recording births and deaths until 1928. Early in 1927 we succeeded in having the model vital statistics law passed; hence 1928 was the first full year under which it is in operation. We had approximately 105,000 certificates recorded for 1928.

"(2) Number of births attended by physicians and midwives. I must advise that we do not keep the records separate, consequently it would be impossible to even make an estimate.

"(3) Our records show that we had 310 deaths attributed to congenital causes. Our records also show 2,624 due to all other causes, under two years of age; also, the records show 509 deaths from all causes connected with gestation and parturition.

"(4) The midwife problem in Texas, as in other states, is a very complex one. We fully realize that the services rendered are inadequate, but personally I do not see how it would be possible to dispense with them.

"We have probably about 6,000 midwives in Texas, about 4,000 of which are registered in the Bureau of Maternity and Child Hygiene, State Department of Health. We do not give them an examination, neither do we issue any license. We merely want to get their names and addresses in order that we may secure in some way the birth certificates; also to keep in touch with them, as we furnish them silver nitrate, without charge, to use in the eyes of the infants.

"For your information, I might state that we have in Texas two well trained negro public health nurses doing what we call itinerant service, going from county to county, visiting schools and getting together midwives, instructing them how to keep clean and what

not to do during labor, and also giving them a few of the warning signs which should indicate the necessity of calling a physician.

"The midwife problem among the Mexicans is also a rather perplexing one, as we have about 800,000 negroes and 800,000 Mexicans, and I presume about the same number of midwives for each race."

Houston, Texas, likewise makes no differentiation, and doubts the possibility of securing facts for a survey. It is indeed fortunate that in other states there are evidenced more concerted efforts toward relieving the midwife situation, and more care is taken in the compilation of state records. Georgia claims that until 1922 no effort was made to supervise, instruct or control the practice of midwives, at which time the annual meeting of the Medical Association requested the State Board of Health to take the matter in hand and investigate the 6,000 midwives who are reputed to bring every third baby into the State. Rigid rules were imposed at that time requiring those midwives wishing to qualify to attend schools of instruction, pass examinations, have negative Wassermann reactions, be vaccinated for smallpox, abide by the laws promulgated by the State Board of Health, and report births promptly. In a report of Joe P. Bowdoin, the number of practicing midwives in 1930 has been reduced to 83.

The Arkansas Board of Health states that the midwife problem has given quite a bit of worry, but since the action on the part of the state a splendid attitude has been found among the midwives, who seem eager to cooperate with the work. Before a midwife is granted a permit to practice in the State she is required to sign a pledge, furnish a recommendation from some physician who knows her work, and, beginning with this year, to present a poll tax receipt. About 70 per cent of the negro births are reported by midwives in Arkansas, but only about 6 per cent of the white births. The Bureau of Vital Statistics at Little Rock offers a report: (See bottom of page.)

Birmingham, Alabama, writes that it has been the policy of the Board of Health to reduce the number of midwives, and that at present there is none licensed to practice within the city limits. A table was submitted to show the number of births delivered by midwives and by physicians in the City of Birmingham in the past few years:

Year	Delivered by Midwives	Delivered by Physicians	Total Births
1917	968	3000	3968
1920	134	4075	4209
1923	26	4964	4990
1926	18	5932	5950
1928	5	5853	5858

Memphis, Tennessee, proffers a summary of conditions:

TOTAL NUMBER OF DELIVERIES

Year	White	Colored	Total
1921	2311	1194	3505
1922	2205	1220	3425
1923	2727	1490	4217
1924	2735	1790	4525
1925	2856	1659	4515
1926	2861	1674	4535
1927	2855	1804	4659
1928	2876	1713	4589

NUMBER ATTENDED BY PHYSICIANS

Year	White	Colored	Total
1922	2179	739	2918
1923	2695	965	3660
1924	2693	1358	4051
1925	2827	1373	4200
1926	2838	1449	4287
1927	2832	1611	4443
1928	2859	1573	4432

Year Births				Rate per 1000 Pop.	Attended by Physician			Midwife			Other		
	Total	White	Black		Total	White	Black	Total	White	Black	Total	White	Black
1928	38,179	29,745	8,434	19.6	30,026	26,800	3,226	7,277	2,177	5,100	876	768	108
1927	40,493	36,555	8,938	20.[illegible]	30,767	28,300	2,467	8,772	2,482	6,290	954	773	181
1926	43,782	34,142	9,640	23.0	33,607	30,547	3,060	10,572	3,539	7,033	1,357	1,132	225
1925	39,219	31,429	7,790	21.3	32,063	29,291	2,772	8,207	2,667	5,540	696	582	114
1924	36,555	29,925	6,630	20.05	30,561	28,209	2,352	6,819	2,194	4,625	789	636	153

Year	Deaths (All causes)			Rate per 1,000 Pop.	Maternal Deaths			Maternal Death Rate per 1,000 B.			Infant Mortality			Infant Death Rate per 1000 Live Births			N. R. Area Infant Death Rate		
	Total	White	Black		Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black	Total	White	Black
1928	20,008	13,152	6,856	10.3	320	198	122	8.4	6.6	15.2	2,552	1,824	728	67.0	66.07	86.3	68.0	....	....
1927	18,311	11,934	6,377	9.5	334	208	126	8.2	5.7	14.0	2,452	1,772	680	60.5	48.6	76.0	64.3	....	....
1926	19,245	12,616	6,629	10.1	328	226	102	7.4	6.6	10.6	2,659	1,963	696	60.7	57.5	72.0	73.3	....	....
1925	17,246	11,323	5,623	9.3	274	181	83	7.0	5.8	10.7	2,542	1,852	690	63.5	57.6	87.6	....	....	....
1924	16,057	10,626	5,431	8.8	282	175	107	7.7	5.8	16.2	2,412	1,808	604	65.8	60.2	91.1	....	....	....

NUMBER ATTENDED BY MIDWIVES

Year	White	Colored	Total
1922	26	481	507
1923	32	525	557
1924	42	432	474
1925	29	286	315
1926	23	225	248
1927	23	193	216
1928	17	140	157

Note: Figures for 1921 not classified according to number of deliveries by physicians and midwives.

DEATHS OF MOTHERS DUE TO PREGNANCY

Year	White	Colored	Total
1921	14	17	31
1922	18	14	32
1923	19	11	30
1924	21	20	41
1925	28	21	49
1926	32	31	63
1927	24	27	51
1928	38	27	65

DEATHS OF MOTHERS DUE TO PREGNANCY PER 1000 BIRTHS

Year	White	Colored	Total
1921	6.1	14.2	8.9
1922	8.2	11.5	9.4
1923	7.0	7.4	7.1
1924	7.7	11.2	9.1
1925	9.8	12.6	10.8
1926	11.1	18.5	13.9
1927	8.4	14.9	10.9
1928	13.2	15.7	14.2

North Carolina, one of the most progressive of Southern states, gives figures:

1. Total number of deliveries year by year for the past eleven years:

1917	1918	1919	1920	1921	1922
76,539	76,175	69,791	81,407	87,456	81,673
1923	1924	1925	1926	1927	
84,190	87,023	83,700	82,459	83,330	

2. (a) Number attended each year by physicians.

1921	1922	1923	1924	1925	1926	1927
56,782	52,521	55,936	58,305	57,195	57,052	58,648

(b) Number attended each year by midwives.

1921	1922	1923	1924	1925	1926	1927
30,674	28,528	27,791	28,261	25,988	24,828	24,165

(3a) The answer to Question 3, percentage mortality of infants in 2a and 2b and causes of death, cannot be answered specifically. The great majority of cases delivered in this State by midwives are colored, and the colored infant mortality in all cases exceeds the white mortality. The infant mortality for colored and white for the period of time, 1917-1927, inclusive, is as follows:

	1917	1918	1919	1920	1921	1922
Colored	133	140	109	113	95	101
White	85	85	74	73	66	70
	1923	1924	1925	1926	1927	
Colored	106	110	105	107	109	
White	70	70	67	71	66	

(b) Percentage mortality and morbidity of mothers in 2a and 2b and causes thereof cannot be answered specifically, but the colored and white maternal mortality for the period of time 1917-1927, inclusive, is as follows:

	1917	1918	1919	1920	1921	1922
Colored	114.8	139.0	117.6	132.2	101.8	99.4
White	68.1	94.0	82.0	86.2	61.0	70.5
	1923	1924	1925	1926	1927	
Colored	107.0	103.8	127.9	125.7	98.9	
White	67.3	65.5	68.0	71.4	50.8	

(4) General attitude toward midwives and requirements for a license. The greater portion of North Carolina is yet rural territory and, therefore, the midwife must be considered at the present time a necessity. I am forwarding under separate cover a copy of the State midwife laws for North Carolina, and a copy of the model county regulations for the control of the practice of midwifery. More than 30 counties of the 100 in North Carolina have county regulations in addition to State laws, and these county regulations are much more stringent in their requirements than the State laws. County boards of health in this State are empowered by State law to make whatsoever rules and regulations they deem necessary to protect the public health, and under this general statute midwife regulations are adopted and enforced by law.

In our own State of Louisiana we have:

BIRTHS DELIVERED BY DOCTORS AND MIDWIVES

Year	Doctors	Midwives
1920	14,152	13,776
1921	15,263	13,654
1922	20,158	19,470
1923	20,510	18,742
1924	23,225	19,892
1925	23,194	18,708
1926	25,855	20,584

Another section of the report reads:

PUERPERAL DEATH RATE PER 1000 LIVE BIRTHS

Year	Per Cent
1923	9.6
1928	10.9

In other words, the State of Louisiana is faced by the fact that instead of an improvement in the past few years, a higher mortality rate is declared. The City of New Orleans, to its credit, shows distinct progress judging from the records of 1922, when 4,020 cases were delivered by physicians and 3,266 cases by midwives, or roughly a ratio of four to three. Then, proceeding to 1928 records, it is found that 6,844 cases were delivered by physicians to 3,279 cases by midwives, or a ratio of better than two to one in favor of the physicians. Sections in the medical law of Louisiana provide that the 224 midwives reputed to be practicing in the State

submit to an examination by the State Board of Medical Examiners before receiving a certificate. This certificate is subject to renewal or revocation upon judgment of this Board.

Touro Infirmary, New Orleans, has organized a plan the aim of which recognizes the need for more intelligent and experienced care of parturition. Pupil nurses, as a part of their undergraduate training in the hospital, are sent under the supervision of two full-time graduate nurses to accompany the obstetrical residents into the homes of the district for confinement cases. They average approximately 90 deliveries per month. This is done with a view of encouraging some of the nurses to become ultimately nurse-midwives. The June, 1920, obstetrical report of the hospital, though this is one of the slack months, presents figures which give an idea of the extent of the work done:

Total number of patients under care during month	191
Total number of visits during month	678
Antepartal calls	44
Onset of labor	42
Post partal	279
Newly born	232
False calls	11
Deliveries	46
Sick calls	24

These nurses are given a well outlined course of procedure which should equip them to give adequate care, as well as to meet emergencies: a plan which seems to serve the double purpose of offering practical experience for hospital attaches, and that even greater boon of removing the hazard so many women face when attended in childbirth by untutored, unsupervised and irresponsible persons.

A nurse-midwife pioneer, Mrs. Mary Breckenridge, R.N., is blazing a trail through Kentucky, thereby emphasizing the vital need in rural districts where the midwife is a necessity, but is actually doubly dangerous due to the scarcity of physicians in those regions. Nurse Breckenridge has banded together a group of women, who are the more commendable for a cognizance of their limitations, yet who are capable of distinguishing the normal from the abnormal, who are trained by experience, and have some conception, however slight, of obstetrical surgery, of the proper method of applying the forceps, and of medical care should the doctor be delayed, or unable to reach the sufferer. "It is economically more feasible to combine nursing and midwifery than to specialize." Mrs. Breckenridge gives this as a practical viewpoint of the poignant need she and her confreres are filling by supplying more intelligent care to their patients. The organization, which unfortunately is not increasing as rapidly as could be desired, is modeled from one used by the Scotch Highlanders, where each nurse-midwife lives in the heart of a district, embracing a radius of not more than five miles, where a local district committee is formed to meet monthly and receive the nurse's report. Certain prerequisites of training are required, and an examination must be passed. A fee of $1.00 a year is charged to cover all services but midwifery, for which they charge $5.00, payable in money, produce, or labor, and for which sum they give prenatal care, delivery service, and full postpartum nursing for ten days. This organization resembles the unit plan suggested by Dr. Meigs for rural districts. The latter specifies supervised nursing service in accessible county seats, equipped to care for maternal and infant welfare.

Improvement in the supervision and practice of rural midwives was reported by the Children's Bureau in 1926 and 1927, possibly traceable to the classes conducted in many states, mostly Southern, by nurses and physicians. During the year 684 classes were organized in twelve states, with an enrollment of 10,881 culled from fourteen states; 5,977 were reported to have completed the course in Arkansas, Delaware, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North and South Carolina, Tennessee, Texas and Virginia. In Florida 1,274 class meetings were held with an attendance of 3,595. Alabama requires monthly conferences with the county health departments of their 3,169 midwives, of whom 1,087 have completed a twelve-course instruction.

To date, one large school of midwifery exists in the United States, the Bellevue School, which was established on August 1, 1911, under a battery of harsh criticism as an alleged recognition of the midwife and an aid to her retention and perpetuation as a medical practitioner. Records of this school show a 10 per cent decrease between the years 1905 and 1917 of the number of midwives, said to be due to substitute meas-

ures to replace them. Besides, in 1917, a betterment in the midwife problem was reported as directly attributable to the influence of graduates of this school, combined with renewed activity on the part of the health department.

Schools for midwives are established in foreign countries under government supervision, which, though not entirely satisfactory to the medical profession, are at least above the average. Therefore a brief resume of the methods adopted abroad may serve to inspire our practitioners in modes of alleviating the problem.

Records in Germany indicate that the better classes are midwives, and that the government, in an effort to bring about a unified adjustment, provides certain fundamental regulations for midwives, laid down by a legislature of the eighteen principalities of the country. Schools in conjunction with universities and large hospitals have been established, where they are expected to pursue various courses, concluded with written or oral examinations. Extension courses and examinations at regular intervals are required in order to force an adherence to modern procedures. Both the city and rural midwife are liable to prosecution if found practicing without the examination exacted by the industrial law. Community standards and privileges, besides social interests and rank, are looked into.

China has recognized the urgent call, and following the close of the Hunan-Yale College of Medicine in 1928, founded a special school for midwives, with the ostensible purpose of lessening maternal and infant mortality. A rigorous course of training is considered necessary before their midwives are declared prepared to receive a diploma and to register with the Bureau of Interior of the Hunan Provincial Government to obtain a license.

Scandinavia, Switzerland, and other countries the size of which equals that of one of our states have remarkably low mortality rates, due to the careful training and supervision of their midwives. Norway and Sweden, with a population scattered mostly in rural districts, insure the proficiency of this class of women by instructing them in various obstetrical operations, procedures on the manikin, pediatrics, and by exacting that they conduct at least 80 deliveries under supervision. As a consequence of the training given its midwives, Denmark is credited with the lowest maternal mortality rate, that of 2.04 per 1,000, and 0.9 per 1,000 for puerperal fever in a population of 3,500,000 in which 78,000 births occur annually. Uganda, a small country under the rule of the British Protectorate, reports one death out of 600 cases. Its native girls must be able to read and write before they are allowed to take a course of 50 lectures and attend 20 labors, the requisites for registering and receiving a license to practice midwifery.

In the Old World, where the midwife originated, conditions give her what would appear to be a permanent foothold. However, the United States is a new country; it is its duty to forge forward, and it would seem that the time is more than rife for us to enlist our strength in instituting some concerted action toward obtaining one of posterity's most urgent needs, scientific and intelligent medical care of parturient women. This can be accomplished only by properly educating, or effectually obliterating, the midwife, our medical menace.

A healthy mother is an asset to the nation. A woman who assumes the responsibility of propagating the race has the unquestionable right to be assured of emerging from the ordeal in as good physical condition as before pregnancy. Furthermore, it is the birthright of her child to be as free from handicaps in its start on life as medical care can make it.

DISCUSSION (*Abstract*)

Dr. Cyrus H. Maxwell, Morgantown, West Va.—I belong among the class B practitioners, for I do not use gloves and do not do episiotomies; in fact, I never saw one. I do not hesitate to stretch and dilate and soften the outlet, spending much time where I deem it necessary. I have had few tears and so far out of 2,900 deliveries no septic infection. I use decent asepsis and rigid antisepsis, washing my hands thoroughly with soap and water and soaking them in bichloride, keeping a bowl of the solution by the bed with a bottle of aseptic oil in the solution to anoint the hands before examining the mother.

For 27 years I practiced obstetrics with no maternal deaths, but lost a case of placenta marginalis from hemorrhage. "Let him that thinketh he standeth take heed lest he fall."

THE ASCHHEIM-ZONDEK TEST (FRIEDMAN'S MODIFICATION) AS AN AID IN DIFFERENTIATING EARLY PREGNANCY FROM OTHER PELVIC CONDITIONS*

By B. T. BEASLEY, M.D.,†
Atlanta, Ga.

There are many amenorrheas during the childbearing period, furnishing problems often unsolved by the most expert gynecologist. The hemorrhages furnish the same degree of apprehension. The enlarged uteri, whether pregnant or pathologically enlarged, have caused some of the most tragic episodes in the surgeon's experience, all due to a mistaken diagnosis. The test perfected by Aschheim and Zondek is a valuable aid in diagnosing these conditions.

The present knowledge of the Aschheim-Zondek test is based upon the following known facts:

(1) Ovulation takes place in response to hormone stimuli either artificially or naturally.

(2) This hormone is produced by the anterior lobe of the pituitary body.

(3) During pregnancy the hypophysis produces more of this hormone than is needed for the body economy and the excess is eliminated in the urine, milk and amniotic fluid.

(4) This hormone has been recovered and compared with the known extract of the pituitary body.

(5) By actual tests, urine of pregnant women, when injected into female mice, three to four weeks old, or female rabbits, twelve to fourteen weeks old, will produce artificial ovulation ninety-eight times in a hundred injections.

6. A. Aschheim and Bernard Zondek obtained 98 positive reactions in 100 injections in white mice in their clinic.

The same degree of accuracy was obtained in the clinic of Charlottenberg, in Vienna, in St. Petersburg, and in the Woman's Hospital, New York. Friedman obtained the same degree of accuracy in his work with female rabbits twelve to fourteen weeks old. P. F. Schneider, of Evanston, Illinois, reported in *Surgery, Gynecology and Obstetrics*, January of this year, a series of 100 tests done on rabbits with the same degree of accuracy.

Harry L. Reinhart and Ernest Scott, of Columbus, Ohio, reported in the *Journal of the American Medical Association*, May 9, 1931, 150 clinical cases in which they obtained 82 negative reactions and 68 positive reactions. In only two cases was the diagnosis not substantiated by the subsequent clinical course.

Thomas B. Magath and Lawrence M. Randall reported in the proceedings of the Mayo Staff Meeting, April 2, 1931, and the *Journal of the American Medical Association*, June 6, 1931, a series of 86 tests with practically the same degree of accuracy.

Aschheim and Zondek obtained positive reactions in all types of pregnancy: ectopic, hydatidiform mole and chorion epithelioma. The fetus, however, in ectopic or normal pregnancy must be alive to obtain a positive reaction, since the reaction becomes negative from two to eight days after the uterus is emptied or the fetus dies. Pregnancy, as early as the third to fourth week, may give a positive reaction. However, accurate readings are not observed until the eighth week is reached. Hydatidiform mole and chorion epithelioma, according to some observers, give a reaction about ten times stronger than normal pregnancy.

Rabbits ovulate at the age of five to seven months normally. However, tests have proved that they can be made to ovulate by artificial stimuli as early as twelve to fourteen weeks of age,and if they are used at this age errors in postmortem readings after injections are eliminated. If injected before this age reactions are not constant except for hyperemia of the tubes, the corpora not being sufficiently developed for ovulation to take place constantly. The same applies to mice.

We began a series of tests at the Grady (Municipal) Hospital, white unit, in January of this year, and have completed 52 injections, using female rabbits. We were handicapped in obtaining rabbits of the proper age at this season of the year and used several as young as eight to nine weeks of age. All of our rabbits twelve to fourteen weeks old gave a typical positive reaction when injected with urine of known pregnancies of eight weeks or more. Several young rabbits gave positive reactions. In all we injected 52 rabbits, 25 with urine from

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women who were known to be pregnant. Two of the rabbits died shortly after and were not autopsied. One of the pregnancies of four months proved to be a dead fetus which had been dead about three or four weeks, and two were tested with rabbits eight to nine weeks old. By discarding these five, our positive reactions were 100 per cent accurate.

Fourteen rabbits were injected with urine from women who were known to be not pregnant, and all gave negative findings. Thirteen rabbits were injected with urine of women in whom a differential diagnosis was sought. One case was a hydatidiform mole which had been curetted some time before and gave a positive reaction. In two five weeks' pregnancies, one gave a positive reaction and the other a negative at first, but was positive at the end of the eighth week. One patient who was three months pregnant was having hemorrhage. She was tested after the hemorrhage was checked and was negative. She was tested a week later with negative reaction. At the end of another week she was examined and found to be not pregnant. She had evidently aborted without observing the fetus or placenta. One case was that of a four months' pregnancy which was negative. She shortly aborted a fetus which had been dead about three or four weeks. Two were women with fibroids in whom a provisional diagnosis of pregnancy was made. Both were negative and at operation proved to have uncomplicated fibroids. Two hemorrhage cases were negative and proved to be not pregnant. Two cases were early suspected pregnancy with positive reactions. Two were early suspected pregnancy with negative reactions. The latter proved to be not pregnant. The other three injections were made in rabbits too young to make an accurate reading at autopsy and were labeled negative.

CONCLUSIONS

(1) The Aschheim-Zondek test for pregnancy is 98 per cent accurate.

(2) The test is a valuable aid in differentiating early pregnancy from other pelvic conditions. However, one negative reaction should not be considered conclusive. The test should be repeated if the clinical evidence warrants a repetition.

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1018-19 Doctors Building

CONGENITAL ABSENCE OF ANAL OPENING*

By R. B. MILLER, M.D.,
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On April 12, 1931, I was called to attend Mrs. B., a white woman, age 24, in her first confinement and at full term.

The labor progressed normally except that she had a very unyielding and rigid perineum. As the pains seemed to be not sufficient to dilate the perineum in a reasonable time, I applied low forceps and delivered her of a male child weighing about six pounds. The forceps extraction was very easy and quick, although the child had a very large head for its weight. There was no unusual pressure from the forceps on its head and no mark of forceps pressure. The cord was extremely short. There was a rather large caput succedaneum. The child was very pale and did not breathe well, although the heart seemed to be beating all right. It would gasp at intervals of about a minute. I applied artificial respiration, heat, cleared its throat, etc., but it lived only about twenty minutes.

In examining it after death I found that there was no anal opening. The family did not consent to a post-mortem examination. I am of the opinion that this child did not have a fully developed rectum, as there was not enough depression where the anal opening should be. Among other abnormalities this child had a double club foot.

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THE DIDACTIC LECTURE*

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In the general inquiry into methods of medical education the didactic lecture has been the source of considerable discussion. The pendulum is still swinging from commendation to censure, but at the present time this method of instruction seems to be definitely in disfavor. Upon reviewing some of the opinions it becomes apparent that the dissatisfaction with the didactic lecture had its growth largely in what might be called the laboratories of education, that is, institutions concerned with educational problems rather than with the application of these problems directly to the students and to medical students in particular. Chadsey,[1] of the College of Education of the University of Illinois, hardly qualifies his condemnation of didactic methods, while Meakins,[2] Professor of Medicine at McGill, is still able to see some virtue in them. There are many opinions between these two, but any attempt to read all of them brings out the fact that in the beginning there is need for definition of terms.

The didactic lecture by definition is simply an instructive or teaching lecture. Since the derivation of the word, however, there have been some connotations which have tended to cast over the meaning rather a feeling that there is something unpleasant about a didactic lecture, that there is something of arrogance, of bigotry, of omniscience in it.

Perhaps the most classical example of all that a didactic lecture should not be is in the little speech Polonius makes to Laertes as he is about to depart from Elsinore. There we have all the objections to didacticism, the finger-pointing, the self-satisfaction, the personal approbation, the lack of discussion of other views; but not all lectures are of that sort. If the out and out opponents of the didactic lecture are asked what is to be substituted for such lectures, it is remarkable how vague many of the replies are. There are talks of laboratory demonstrations, bed-side instructions and outside reading, but as a matter of fact nearly every substitute requires a didactic talk somewhere. The fact that a patient or a laboratory animal is present to serve as a nail upon which to hang the thread of discourse does not keep such a procedure from being didactic.

It is necessary to bear in mind the aim of medical education as the question is being discussed. It is assumed that a medical education serves two purposes. It must impart to the student as much information as possible and that information is primarily concerned with the care of the sick. But beyond that it must teach the student a method of progressive study in such a way that ten and twenty years from now, when medicine will be a different thing from what it is today, the student will still be able to keep informed. Therefore, any method of instruction, to meet with approval, must satisfy the requirements of both aims. The latter aim, which is to teach the student to study independently, is the one which many believe is best served by other than didactic methods. There is no reasonable doubt that the student who has learned to study for himself and to think for himself is the one best able to do so later in the practice of medicine. It is by no means certain, however, that students, by the time they enter medical school, have reached the stage where they may safely be left to learn to study for themselves even when presented with the most inspiring examples.

As seen in medical school, students tend to group themselves into three classes. There is an upper 10 per cent which will make progress under any method. There is an inferior 10 or 20 per cent which no method will help. Finally there is the large group in between which, so far as the purpose of the medical school is concerned, will progress very largely according to how they are trained and what habits they develop under instruction. This group comes into medical school without any very well developed habits of study. They have not yet learned to grasp essentials first and details later. They are not alive to the necessity for historical background, for acquaintance with literature, for exact observation. They will not find the way through the maze of medicine by themselves. By precept and force they may be made into good students; they may be led out of bad habits of study into good ones; in other words, educated.

The didactic lecture as it stands for criticism

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is often pictured as a set lecture abstracted from a text book perhaps strongly tinctured with personal view derived from experience. Not only that, but as given it is too often presented by the less experienced teacher whose knowledge is still germinating. It is true that such a lecture could well be omitted and the student could use his precious time in reading an authoritative text. But it is the entire question of didactic lectures which is being criticized and not only the poor ones.

It may be well to consider what a didactic lecture may reasonably hope to accomplish. In the first place, it may present the historical background; few medical students read the history of medicine. It may present the essential facts; the average student is frequently unable to differentiate them. It may present a summary of the literature on the subject and by so doing awaken the student to the necessity for this information. It may outline the developments to be expected in the particular subject in the future; what student is capable of that? The entire subject may be leavened by the personal experience of the teacher, and no student has that. Finally, it may arouse exactly the thirst for actual personal doing and contact with experiment and patients that is so much to be desired.

It becomes apparent, therefore, that much of the criticism leveled at the didactic lecture is actually directed at the teacher because he fails to accomplish all this. That the instructor does fail is apparent from the investigation of Wilson,[3] who found that only an average of little better than three members of any medical faculty were particularly impressive to the students.

It is undoubtedly a sign of health that the schools are considering what type of instruction is best and whether the best interests of the profession at large are being served by present methods. It may be, however, that too much attention is being paid to method and not enough to personnel. The obvious faults of didacticism creep in everywhere. They are found in the laboratory, the operating room, and at the bedside. No methods will be able to prevent it. The inexperienced man is no more able to hold a lecture than he is to demonstrate anatomy or operate before students. The egocentric clinician will do as much damage to education demonstrating a delivery as he will in the lecture hall. The physiologist who lives only by the text book will stultify minds as well in the laboratory as on the platform.

There is a tendency in some schools for the head of a department to limit his teaching very largely to graduates and interns. This is done probably with the idea that these men are best qualified to progress and to justify the attention thus bestowed upon them. Even if it could be granted that this is so, the fact remains that probably the very students who need the most expert teaching are thus deprived of it and their lot it is to be guided by the understudies in the department. There are many brilliant men who seem to forget that there is a time with every student when he knows nothing of the subject at hand and that his progress and attitude toward it will be determined by the skill that is used in directing his efforts.

Great care should be taken, therefore, in exposing students to teachers. The teacher who is historically informed, who possesses culture, who analyzes the literature, who so lives that his students have only the desire to be like him, will produce good students by any method.

No criticism is made of any attempt to produce more independence in the student. Curricula which will develop his appreciation of research, use of the literature and substitute actual doing for seeing and hearing are worthy of every encouragement. But at some place in every subject it is necessary to educate partly by word of mouth. Therefore, instead of condemning the didactic lecture it should be seen to, rather, that such lectures are delivered by the proper teacher and that they do all that such a lecture may do. When this is done there will still be a valuable place for the didactic lecture.

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DISCUSSION (*Abstract*)

Dr. W. S. Leathers, Nashville, Tenn.—I believe we have gone to an extreme in eliminating the lecture as a method of teaching in medical education. There are teachers who can make a very inspiring and effective discussion in presenting a medical subject to a class. This may be purely didactic or by the use of patients. In some subjects of the medical curriculum, for example, public health and certainly the fundamental sciences, I believe that the lecture method of teaching

can be used within limitations in a very helpful way. Moreover, the personality of the teacher may be of definite value in his contact with students from this point of view. It is generally agreed that students should be taught in a large measure by the study of patients and it is also necessary that the experimental method be used in teaching the fundamental sciences, but neither of these methods precludes entirely class conferences, lectures and discussion of patients before a class as a group. I realize that members of the faculty differ in their interest with reference to this phase of instruction and I am sufficiently liberal-minded to concede that each member of a teaching staff should use the plan and employ those methods which have proven of greatest value in his experience as a teacher. I arise merely to emphasize the value of the lecture as a means of reenforcing the experimental and clinical methods of instruction.

THE TEACHING OF THERAPEUTICS*

By JAMES S. MCLESTER, M.D.,
Birmingham, Ala.

Success in treatment is the ultimate goal of the practice of medicine, and since medical teaching is, in the majority of instances, intended to train the student for practice, it is fair to assume that the decisive object of all such teaching is the development of acumen and skill in the treatment of the sick. If the student does not learn this and if he is unable later to acquire it, then he will be a failure.

The physician must have a clear conception of the nature of the disease else his efforts at treatment will obviously be haphazard and in the main fruitless, and it is due to the realization of this, as well as to the interest which attaches to the study of pathology, that in the past a disproportionately acute interest has been exhibited in the nature of disease rather than in its cure. This is an old criticism and its justice is generally recognized.

Today, however, tendencies in another direction are clearly visible. It looks as if the teaching of the future will concern itself more intimately with treatment; not with treatment as a subject apart, but rather with the management of the sick as an inseparable and all-important feature of what we call the practice of medicine. I have often thought that the German expression for practice of medicine, *specielle Pathologie und Therapie,* is an excellent one, a more accurate one perhaps than our own, for in the final course of medical instruction, to which all earlier teaching has been merely preparatory, the aim is to teach the student special pathology and therapy. A better balance between these two is now being observed and we may expect in the future increasing recognition of the importance of well considered therapy. Evidences of this are seen in the great technical advances which are being made in the modern methods of treatment. We have largely escaped the empiricisms of the past and, in therapy as well as in pathology, are wisely inculcating in the student an inquiring turn of mind. He is being taught that the rationale of a proposed measure and the evidence offered by animal and clinical experiment must all be weighed before the method is finally evaluated. We have learned to replace the old "shotgun" mixtures with single drugs of known influence, and chemotherapy is receiving constantly greater attention. It is significant that physical methods are no longer relegated to the quack. Because physiotherapy makes a deep impression upon the credulous and therefore lends itself readily to charlatanism, many of us have in the past been afraid to touch it. Nevertheless, students are learning the value of physical methods and are being taught the technical details of their application. In this and in many other ways methods of treatment are becoming more effective and broader.

All of this indicates a healthy tendency, but in one important particular present methods are woefully at fault, and this is my thesis today. We still teach the student largely to treat the disease. We should teach him to treat the patient. It seems trite to say that it is not sufficient merely to label the patient, and after placing him in the proper category, to prescribe the treatment standardized for that category, but this will bear repetition. The patient must be envisaged as a person with all sorts of traits and tendencies, constitutional and acquired, plus a disease which in itself is apt to be extremely variable. If treatment is to attain its highest degree of success, all of this must be taken into consideration. True, the student is already learning to look at the patient with a larger degree of sympathy and a better understanding, and to study him as well as his disease, but he must learn also to plan his treatment with the same attitude of mind.

We are apt to deride psychotherapy because it has sometimes been pushed to ridiculous extremes, but the longer I study ailing humanity the more do I become convinced of the genuine influence of emotional and psychic factors upon the course of disease. Successful physicians everywhere, consciously or unconsciously, gauge

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their approach to the patient and the directions which they give, not alone by what they see of his illness, but also by what they understand of his constitution, his personality, and his reaction to disease. Advice regarding rest, exercise, occupation, the amount and kind of work permitted, the arrangement of the diet, domestic and social relations, and many other things, as well as the use of drugs, should be governed in some measure at least by factors other than the nature of the disease. The influence of the emotions upon the vegetative nervous system and its physiologic ramifications is such that even the course of a purely organic disease such as peptic ulcer is often dependent to some degree upon contentment and happiness. I am told that following the stock market crash most of the old ulcer patients in New York returned to the physician for further treatment. I have seen the gait of a pernicious anemia patient with cord changes grow worse under the influence of domestic grief and difficulties and improve in a graphic manner when these handicaps were removed. The man with tuberculosis will sometimes improve even though he is permitted to remain in a slightly unfavorable occupation because he finds therein economic security and contentment, whereas if he is compelled to change to an unfamiliar occupation carrying difficulties he may grow worse and die. One such patient will improve wonderfully when sent to a better climate; another under the depressing influence of homesickness and poverty will succumb. Recovery from pneumonia often depends upon many extraneous factors, among them the patient's comfort, the nature of his surroundings, the water given him when he cannot ask for it, the exertion saved him and the amount of morphine judiciously given him. For one such patient, to roll him over and examine the chest at almost every visit is possibly excusable; for another it is well-nigh fatal. In other acute infections also we are too often intent solely upon accomplishing an ultimate cure and are apt to ignore the patient's comfort; unfortunately the extent of this omission is often directly in proportion to the physician's interest in the patient's pathology. The future physician should learn to inquire concerning the patient's comforts and to utilize the thousand and one means, medical and otherwise, by which distress may be relieved. What we say to the patient may profoundly influence the course of his disability; to explain in detail the nature of his disease will relieve the distress of one person and aid in his recovery; in another instance such an explanation will be ruinous and frustrate all treatment. The one requires patience and gentle handling; the other, strong-arm methods according to the sometimes useful principle "treat 'em rough; tell 'em nothing." The student must learn all of this.

How can an understanding of such intangible things be given the student? It is not easy, for much of it comes only through long experience and contemplation. If the student is permitted an intimate contact with the patient, and if he has the right sort of human interest or is able to acquire it, then little by little he will learn how to treat the sick. To be more specific, I should say first that his instruction in therapeutics should be given as an integral part of his medical training and not as a separate subject. I am one of those who believe that as early as the latter half of the second year, when greatest emphasis is laid upon physical diagnosis, some approach to therapeutics should be made; not that the student at this time should be drilled in the most effective utilization of digitalis or the construction of the ketogenic diet, but that he should be taught broad general principles of management so that he will learn to look at the patient not only through the eyes of the student of disease, but also with the understanding of the physician whose function it is to heal the sick. In delving into the patient's emotional state, his domestic and social problems, his reaction to his environment, and his constitutional handicaps, as does every good physician, the student must realize that these things assume greatest importance only when they are permitted to serve as guides to treatment.

I know of no better training in therapeutics than that which comes from the assumption of responsibilities in the dispensary. If the sole management of a patient in its many details is delegated to the student he will learn much. To illustrate: when the advice of a consultant in one of the specialties is needed, the student in charge, after himself making the appropriate examination, should accompany his patient to the department to be consulted and should discuss with him the measures recommended and correlate these with the instructions already given. If the patient does not understand the directions given him, if he fails to cooperate, or if he does not return at the proper time, it is the student's fault; he has not managed him properly. It should not be beyond the province of this embryo practitioner, with a social worker if necessary, to visit his patient's home. Such experiences are valuable.

To recapitulate, in order best to equip the

future practitioner to fulfill his destiny, we should teach him the full scope, in its broadest sense, of the management of the sick. This training should not constitute a separate course, but should be inseparable from that which deals with the nature and manifestations of disease. It can be made most effective by placing the entire responsibility for the treatment of the dispensary patient, in all of its details, upon the student, with a critical scrutiny of results.

DISCUSSION (*Abstract*)

Dr. J. E. Paullin, Atlanta, Ga.—The paper by Dr. McLester has directed our attention to one of the weaknesses in our present day methods of teaching. This particular problem has given us a great deal of concern. The student who comes to the third and fourth years fresh from his training in physiology, chemistry and pathology can readily grasp certain types of therapeutic procedures that are in keeping with his idea of what disease actually does to the body, for example: the use of digitalis in certain types of heart failure, the use of arsphenamine, bismuth, and mercury in syphilitic infection, or quinine in malaria. These remedial agents and the methods by which they are given can, to a certain extent, be standardized and the student can grasp the necessary reasons why they are to be used. They can also recognize that certain other types of disease, such as empyema following pneumonia or an acute inflammatory condition of the appendix or a fracture of the limb, require another type of therapeutic procedure which they easily and willingly grasp, and in turn the student thinks of therapeutics in a mechanistic manner. The conditions are capable, to a certain extent, of standardized treatment. So far our instruction is good, but as yet he has not become acquainted with the art of therapeutic healing as separated from the standardized or mechanistic.

When a patient consults a physician he comes primarily to get rid of his complaints. He is interested, to be sure, in the question of diagnosis, but he is much more interested in getting rid of the disability that his disease produces. He wants a cure. In order to effect this cure, as has been so well brought out by Dr. McLester, the things necessary are: first, to have an accurate idea of the patient's disease; second, to study the person who has the disease from the standpoint of a human being. It is necessary, in order to establish a successful therapeutic regime, to know something of the patient's early surroundings, the environment under which he was reared, his economic and financial status, the general trend of his mentality and his reaction to emotional upsets. How are we to teach the students the art of getting this information and utilizing it? There are two possible ways: first, to bring students in closer contact with patients in the ward; second, to utilize the out-patient department in developing this side of therapeutics. Even then, under the most favorable conditions, the student will get only a slight acquaintance with this method, although it will give him a background which can be furthed developed when he begins his internship. He, therefore, should be taught in the out-patient department the practice of medicine as it will be followed by him in his office. Here he has the association with older and more experienced men as consultants, and he learns from them their approach and method of dealing with patients. The instructor by example endeavors to impart this information to students and in this way they are taught humanistic therapeutics.

Dr. H. M. Winans, Dallas, Tex.—Of course, one of the worst defects in acquiring exactly the approach to the patient that Dr. McLester and Dr. Paullin have mentioned lies in the type of patient that the student comes in contact with during his studying years. The dispensary patient and the patient in the wards in the hospital are not likely to constitute the type of patient that the student is going to treat or help to treat in later life. If we can use a hackneyed phrase, the psychology of those patients is quite different from the psychology of the type of patient which is going to make up the remunerative part of his practice later. So the problem is really twofold. I agree that the student should know how to approach this dispensary patient; he should understand his problems; he should understand the patient as ordinarily encountered in the charity wards of a hospital; he certainly can have no understanding of humanity unless he understands their problems; but later he has what we might call a more highly specialized type of individual to deal with, and he should be prepared to some extent to deal with those persons. Now, in recognition of that fact we have made an experiment at Baylor University which is not new, but the application is new, and that is a return in some measure to the preceptor system of former years. These men in the fourth year are assigned to busy practitioners in the hospital, men who have private patients in the hospital, men of good standing in the community. They are sent around with those men, not for the purpose of observing their diagnosis, though that may come in; not for the exact purpose of observing details of treatment, but to observe how they treat the patients, how they approach the patients, how they answer their questions. The time is short, but we hope it will give them some little help in solving the problems which these gentlemen have brought up.

Dr. Lewellys F. Barker, Baltimore, Md.—Both Dr. McLester and Dr. Paullin have urged the importance of the study of human nature, of the constitutions and the personalities of patients. In addition to gaining a knowledge of what have been called "disease entities," we have learned to recognize that many of the symptoms exhibited by patients are simply some of their responses to either an inimical or a friendly environment. To understand the total behavior of a patient, we need a knowledge (1) of his constitutional tendencies and (2) of his whole environment: physical, psychical, and social. Only through such knowledge dare we expect fully to grasp the patient's modes of response to his environment. Unless we can educate medical students to understand the importance of a broad biological conception of man, medical education will be a failure. Of course, we have gone a long way in this direction by getting away from unidimensional diagnoses of the old type; we used to be satisfied with a single diagnosis, say, of "neurosis," or of "valvular disease of the heart." Now we study each patient from top to toe; we examine not only his body, but also his soul and his spirit; we make multidimensional diagnoses.

The student should be taught that in every case, except one of primary surgical emergency, a complete general diagnostic survey should be made and the therapy should be comprehensively planned upon the basis of the multidimensional diagnosis thus arrived at.

When a patient turns to a specialist directly, rather than to a general man, this method is but rarely applied. That is why surgery, which has made great advances and has been tremendously useful, has sometimes hindered the best type of medical education, since all too often it has been satisfied with one-sided studies of patients. Not infrequently the surgeon fails to discover all that he should about a patient before he operates upon him; nor does he always follow him adequately afterwards. An exploratory laparotomy should never be too frivolously undertaken, for, even when the findings at operation are negative, the procedure may result in adhesive peritonitis afterwards.

The psychiatric reports that I receive as parts of group diagnostic studies are often most helpful in arriving at true conclusions regarding the total general state of the patient before me. Take, for instance, the patient who "complains of everything," the individual whom we used to call "a hypochondriac" because he exhibited a "chronic invalid reaction" out of proportion to discoverable physical findings. He may have already been submitted to multiple operations; we may find that his tonsils are out, his teeth are out, his appendix and gall-bladder are out; if a woman, she may have had several gynecological operations. Unless the examiner recognizes in patients of that type the mental and emotional disturbances that exist he may be misled and advise still more unnecessary surgical intervention. Then there is the elative-depressive group, persons who, when they believe themselves to be well, exhibit excessive "drive" and "go hard" for a time; then they become asthenic, tire too easily, lose their "pep" and their interests and become depressed. Unless the examiner has become familiar with that type he may wholly misunderstand the meaning of the symptoms. In such persons, depression tends to occur in periods that alternate with periods of elation and pressure of activity.

Students should be thoroughly taught, too, with regard to the importance of the guidance of patients in "the way of life." Many patients who are well-to-do have no absorbing interest and no regular work; one has to find out how to get those people to work, or how to get them interested in social service or in something else that will give them sufficient occupation. In lieu of anything better, one may have to begin with contract bridge. Though this may be a rather low type of interest, it may be useful temporarily, for almost any absorbing interest that will draw a patient's mind away from introspection may do him a great deal of good. No detail of life that can be significant should be overlooked. I have known dyspareunia to cause a great deal of trouble in families. I have known more than one man who continued to manifest perplexing symptoms until he got rid of a too fascinating stenographer. Such situations may be of real importance in the life of patients.

Now, how are we to make students understand the importance of this general biological conception of man? It seems to me that, in the first place, students should come into contact with teachers who, themselves, possess this broad concept, who look upon patients simply as living organisms, of variable hereditary constitution, responding to the environments in which they live, and who, in the study of patients, give due consideration to heredity, on the one hand, and to the whole environment (physical, psychical and social), on the other. The task of practicing physicians is to make sure that the responsivity of patients to their environments is made as adequate as possible; it may often be necessary to try to help patients to choose environments that are suitable to their constitutions. Teachers, themselves, learn about life in very different ways. A distinguished orthopedist, a teacher in one of our best medical schools, once told me that he had learned more about human nature from the back end of a street car, at a time in his life when he was working as a street car conductor, than in any other way.

In the second place, students should early be taught how important it is for them to come into contact with human beings in all spheres of life. I believe that the dispensary can be made even more important than the wards for the teaching of therapy. And, in order that the student may come into professional contact with kinds of people whom you do not see in the wards and also with kinds of people whom you do not see in the dispensaries, recourse to the preceptor method, as Dr. Winans pointed out, may be very advantageous. Moreover, the part-time teacher, working alongside of the whole-time teacher in the medical school, can be very helpful to students because of his constant contact with private patients. It is all right for the workers in the research departments of the hospital to restrict their activities largely to the investigation of patients who are selected as material appropriate for their particular research studies; but, for the medical student, it is extremely important that he should come into contact with all types of disease and with all types of human beings, and if in these contacts he can have the leadership of a humanist, such as Osler was, for instance, all the better.

Dr. J. H. Musser, New Orleans, La.—I think that nine-tenths of the members of the classes that graduate from the medical school will tell us that the course that has failed most completely in the school is therapeutics. Unfortunately, the medical student wants to have a prescription for everything, and he feels that the teacher who will recite to him a prescription for this or that which he can jot down in his little book is fulfilling most adequately his duties as a teacher. He wants every disease labeled, and he wants a specific for that disease. But, as we know, there are very few specifics in medicine; and, as Dr. McLester and Dr. Paullin pointed out, the use of such specifics is usually very adequately taught. After all, the great bulk of medical practice, as Dr. McLester said, is made up of individuals who do not have a disease to which a definite specific name can be given. Perhaps a third of all the cases of the average medical practitioner is made up of persons who have a functional gastric disturbance. While we make a diagnosis of a "functional gastric disturbance," actually we realize that this disturbance is very much deeper than the stomach, and it becomes necessary to analyze that patient completely. Of course, it is difficult to delve into psychogenetic factors with students, and it is extremely difficult to do it before a large section. Here it is, I think, that the greatest benefit from the use of the out-patient department can be realized. In seeing the patient over a long period of time and learning his reactions in general, the student comes in really intimate contact with that particular patient and learns that it is of supreme importance often to treat the patient as well as the disease. I personally do not believe there is very much difference between the out-patient and the patient who has much more money. The out-patient and the other patient are very much alike under the skin; unfortunately, we are inclined to look upon the out-patient

as a person who has a disease or a person who comes to us merely for a bottle of medicine. And I think that this conception illustrates the advantage of a method of teaching which we hope to carry out in the future at Tulane. We are planning to give the students their own little offices, where they can see the patient, take just as much time as they want to go over that individual, and handle him (we hope) as they would a patient in their own private practice. The importance of the history Dr. Barker has accentuated, the getting to know the patient. Just yesterday I received a letter from a young man who had been with us as a full-time man for several years. He wrote me a long letter, in which he said he had always thought, deep in his heart, that we rather overdid our emphasis on the necessity of taking a thorough history and spending a long time talking to patients. He said that only in the last few months in private practice had he come to realize the importance of getting down deep into the soul of the patient, learning his reactions as well as his sensations, as a basis for proper therapeutics. I think in the course of time this condition of inadequate teaching of therapeutics will be changed, because we shall be able to sit down (that is, in our own school) with the patient and with the student and be able to talk over with them both, not so much the giving of iron or the administration of arsenic or liver extract or whatever we are going to give that patient, as to straighten out this patient's life hygienically, handle his peculiarly sensitive psyche sensibly and use all manner of agents other than drugs.

Dr. H. V. Noland, Louisville, Ky.—We have followed the system of assigning students a certain number of patients a week, giving them time to study the cases, giving ample time, under the supervision of a visiting man. That man has ample time to check the history, the physical diagnosis and the therapeutic measures that have been instituted and also to discuss with the student the social and economic problems that happen to confront that patient. We have not found that entirely satisfactory, because it is not complete. In our specialized patients, particularly the cardiacs and diabetics, we have been able to do a certain amount of follow-up work through the social service department; and from that we have been able to determine what amount of benefit the patient is getting from the treatment and how he is following it up. The average dispensary is so busy that it is rather difficult for the students to make visits to the patients' homes, which in private practice is necessary in order to get an adequate picture of the patient and his surroundings. The only solution is to acquire an adequate number of trained social workers who can report back to the physician the patient's surroundings, and that can be made part of the record. In that way the outside influence will be brought to the student's attention and sooner or later will become an integral part of his medical mind.

I agree with Dr. Musser that patients are pretty much alike. We do not see a great deal of variation in human nature, and for that reason it is very important that the students be taught to consider dispensary patients as they would their private patients and be given adequate time and be taught to assume full responsibility for the care of the individual.

A thorough knowledge of specific drugs and also a thorough knowledge of what to use and what not to use, in other words, symptomatic therapeutics, are very important. We should be able to instill confidence into the patient.

Dr. W. R. Houston, Augusta, Ga.—Dr. Barker wrote a paper in 1906 which I happened to read over the other day. He had seen a physician abroad who enclosed patients on wards behind curtains, kept them there for some ten weeks and fed them. Dr. Barker gives a succinct account of the symptoms the patient had, the length of time he stayed in the hospital, and how he emerged healed of all he had when he went in. But he does not mention in any part of his paper what transpired between himself and the patient in the course of this treatment; he does not say what he said to the patient or what the patient said to him. After all, that is the fundamental thing, but it goes on behind closed doors and is hardly ever printed by any one. I suppose Dr. Barker felt (I know I should if I should write such a paper) that what a ward patient said to him and what he said to the patient would sound too inconsiderable to be put down in print, and yet it is the real nub of the thing when it comes to managing that patient, to learn what his difficulties are and what shall be done to relieve those difficulties. Out of the mass of psychotherapeutic measures emerges at least one thing of value; that is, that a great deal of time can be spent with patients and should be spent with them. Now, these students, as has been brought out here by Dr. Musser, have plenty of time to spend with the patient. They can sit down with the patients and take plenty of time to talk with them.

I cannot conceive of any more difficult problem that confronts us than that of what the student or physician should say in encouraging and guiding the patient. The problem is one of guidance. How is guidance to be done? I quite agree with all those gentlemen who think that a ward patient or a clinic patient is not fundamentally different; in fact, he is in some ways decidedly a better patient for the student to be taught on than some spoiled daughter of plutocracy who does not really want to get well. As a rule, the clinic patient wants to get well; and the rewards of a moderate amount of time and attention spent on a ward or clinic patient are generally greater, from a therapeutic standpoint, than on those in more sheltered life.

Dr. Walter L. Bierring, Des Moines, Iowa.—A few years ago it was my privilege to make a study of the teaching of pharmacology in the medical schools of the United States and Canada. I was interested to find that the teaching of pharmacology had been extended very much beyond the teaching of the administration of drugs, and now includes the use of many sera and other remedial agents for the treatment of disease. I was greatly impressed by the plan of teaching that has been developed at McGill University in the closer union of the department of pharmacology and the department of clinical medicine. An associate professor in medicine is also a member of the department of pharmacology, and, likewise, a teacher in the department of pharmacology is on duty in the out-patient department, and once a week conducts a word class in applied pharmacology. This offers an opportunity of intimate contact between the teacher of pharmacology and the teacher of clinical medicine and constitutes a distinct advance in the training of under-graduates in applied pharmacology.

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EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Twenty-Fifth Annual Meeting
New Orleans, Louisiana, November 18-20, 1931

THE NEW ORLEANS MEETING: A NECESSITY, NOT A LUXURY

The incidence and severity of many diseases differ in the South from those in other parts of the world. The dietary and hygienic habits of this section are not strictly those of any other, and these factors always modify the expectancy of life and illness. This is, however, but a small part of the reason for the banding together of the members of the Southern Medical Association.

Life below the Mason-Dixon line has always stood half way between that of the highly specialized, urbanized and mechanized North and East and that of the simpler, self-sustaining agricultural communities, such as Stuart Chase describes in Mexico, where "flowers are more important than motor cars, radios, and bath tubs."

The Southerner, in spite of his motor cars, radios and bath tubs, his swifter education and industrialization of recent years, has retained an intimate personal relationship with his employe or employer, his client, patient, business or professional associates. The Southern physician has never ceased to practice medicine by a principle which learned specialists in other lands daily forget, rediscover, and urge in essay and oration: "Individualize each case. It is half the battle to win the confidence and friendship of your patient. Treat the patient, not the disease."

In this part of the country, no one has ever thought of treating a human being by any other plan.

In many of the highly civilized parts of the world today, one may go through a whole professional day studying among strangers who do not even ask one's name. In the civilization of the South, this sort of relationship could never exist. Friendliness is one of the chief flowers of Southern culture.

Technical progress, however, has never been sacrificed to sociability. Nowhere in the world have secondary schools, colleges, medical schools and private medical practice gone forward as they have in the South in the past ten years. The modern ideas on healing can now be disseminated as well or better by Southerners than by practitioners in Vienna, Edinburgh, Paris, Berlin, or Boston. The courtroom of medical culture has moved from the older countries, and the South is one of the leading claimants to the throne.

It is no longer necessary to send a patient a thousand miles north, south, east or west in search of efficient medical care. Here it is, in the South. It is no longer necessary to send one's children a thousand miles away to be educated. Men and institutions are as good in the South as can be found.

The three-day meeting of the Southern Medical Association in New Orleans in November will present a day of general clinics conducted by outstanding men of the South and elsewhere. There will be two days of meetings of special sections of the Association. One day of general clinical meetings will be provided by the local profession, and its ability to conduct these is well known. The scientific exhibits, which are most promising, will give an opportunity at any time during the meeting for close study of particular subjects, and for personal contact with men doing original work in various lines. The technical exhibits have been for the past few years notably worthy of study. The modern physician requires an increasing amount of technical equipment, and he finds these exhibits of great value in selecting for him new instruments, drugs, books, special foods, and methods.

The meeting will be neither so large that one's individuality is lost, nor so small as to fail to provide adequate intellectual direction.

The time of the year will be the most agreeable that could be chosen for a visit to a semi-tropical city. The meeting will acquaint you with your ablest medical neighbors and will acquaint your neighbors with you. The Southern Medical annual meeting in New Orleans for Southern physicians is not a luxury, but a necessity.

THE NEW ALABAMA STATE JOURNAL

In July of this year appeared the maiden number of the *Journal of the Medical Association of the State of Alabama and of the State Board of Health*, containing the address of the former President of the State Medical Association, Dr. W. G. Harrison, and other excellent papers read during an unusually well prepared program at the last State meeting. The first number is most creditably gotten up, from a mechanical and scientific standpoint, is well worthy of attention, and will be enjoyed by those outside the State.

The editors of the new journal are the efficient and energetic State Health Officer of Alabama, Dr. J. Norment Baker, and Dr. Douglas L. Cannon, who is Secretary of the State Medical Association. Cooperating with Dr. Baker and Dr. Cannon in the Publications Committee are Dr. Fred W. Wilkerson, Chairman, of Montgomery, Dr. W. W. Harper, of Selma, and Dr. J. S. McLester, of Birmingham, men whose names have long stood out in the annals of curative medicine and of medical progress in general in Alabama. The combination of the two overlapping agencies, the State Department of Public Health and the State Medical Association, is a fortunate one for the public and the profession.

One learns medicine by reading and writing it. The SOUTHERN MEDICAL JOURNAL welcomes this new member into the family of state medical journals of the South, and rejoices in its initiation as further evidence of the activity of the progressive spirit which is daily more and more alive in the South.

May the new journal have many subsequent issues of equal merit!

CHOLESTEROL

Many years ago it was shown that sugar, a ready source of energy, was increased in the blood in times of excitement. Injections of suprarenalin under the skin likewise increased the blood sugar, and suprarenalin was shown to be released into the blood during emotional disturbances, as during fear and rage. Presumably the suprarenals were stimulated through the sympathetic nervous system, excess suprarenalin entered the blood stream, which released sugar from glycogen stored in the liver, and a ready source of energy was thus mobilized for the muscular contractions of giving battle or fleeing from a foe.

Cholesterol is defined as a monatomic alcohol, or sterol, occurring in the form of large square scaly crystals with an unctious feel. Its function in the body is very little known and it has been questioned by some that it serves any useful purpose. By others it is believed to be a product of cellular activity. It is present in the blood of both herbivora and carnivora at a constant level, even when no appreciable amount is ingested. It occurs in quantity in brains and in milk and egg yolk. It is found particularly in the red cells and nervous tissues and in the bile, whence it precipitates to form the commonest variety of gallstone.

It is, of course, a normal part of a mixed or carnivorous dietary, but is not ordinarily a constituent of the diet of herbivora. Arteriosclerosis may be produced in rabbits by feeding them large quantities of egg yolk or of purified cholesterol.[1]

For a time, this sterol was believed to be the source of vitamin D, because the vitamin was produced by the action of ultraviolet light upon cholesterol. Activated cholesterol seemed to be a pure form of one of the previously unisolated accessory food factors. Later ergosterol, a substance which in minute quantities contaminates most preparations of cholesterol, was shown to be the material which irradiation transforms into the antirachitic vitamin. Cholesterol itself cannot be activated to heal rickets.

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1. Bailey, C. H.: Atheroma and Other Lesions Produced in Rabbits by Cholesterol Feeding. Jour. Exp. Med., 45:595, April, 1927. Ed., Sou. Med. Jour., Spleen and Atherosclerosis, 20:417, 1927.

In diabetics, the cholesterol level of the blood is raised, like that of the blood sugar, and diabetics are notoriously subject to arteriosclerosis.[2] One feels that, since cholesterol feeding can produce arteriosclerosis in some species, the elevation of the diabetic's cholesterol is very possibly related to his tendency to this disease of old age. High viosterol feeding likewise induces arteriosclerosis,[3] with what effect on the blood lipids is not known.

The blood cholesterol is diminished in hyperthyroidism and elevated in hypothyroidism. In nephrosis with edema, it tends to rise with the edema and to fall as the edema subsides.[4] Since hyperthyroidism depresses it, and since it apparently needs depressing in nephrosis with edema, a basis for possible benefit from thyroid feeding in edema is suggested.

From Cannon's laboratory at Harvard have come recent experiments which throw light upon one of the functions of cholesterol and increase the evidence of its importance in metabolism. Lyons[5] studied its relation to emotional disturbances and determined the level in cats in cages before and after they had been frightened by barking dogs. The amount per one hundred c. c. rose about 27 per cent within twenty minutes after the cats had been frightened, returning to its customary level in an hour. The rise occurred in all except the sympathectomized cats, showing the control of the sympathetic nervous system over cholesterol distribution. The elevation of cholesterol becomes, then, another of the ponderable chemical response to psychic stimuli.

Lyons concludes that cholesterol, like sugar, is concerned in the immediate defense reactions of the body. The constancy of the rise supports other evidence that the cholesterol of the blood and nervous system is an essential, not an accidental or inert, substance.

2. Warren, Shields: Pathology of Diabetes. Philadelphia: Lea & Febiger, 1930.

3. Sweeney, M.; and Smith, Erma: Experimental Arteriosclerosis in the Rat. Amer. Jour. Physiol., 95:620, Dec., 1930.

4. Calvin, J. K.; and Goldberg, A. H.: Cholesterol and Edema: Relationship in a Group of Children Presenting the Nephrotic Syndrome. Amer. Jour. Dis. Child., 41:1066, May, 1931.

5. Lyons, C.: Emotional Hypercholesterolemia. Amer. Jour. Physiol., 98:156, Aug., 1931.

GLEANINGS FROM RECENT JOURNALS

Infantile Paralysis.—In New York and other parts of the East, a revival of the epidemic of acute anterior poliomyelitis seems to be in progress. Observations of Dr. Montrose Burrows,[1] of Pasadena, California, on the course and symptoms of the disease give a point of view slightly different from the usually accepted one concerning it.

Burrows observes that in all autopsied cases, hyperplasia of some or all the lymphatic structures takes place. He says that the disease, which is as widespread as measles, enters by the gastrointestinal lymphatics. Nearly all the population is susceptible, although few contract it to the paralytic stage. In an epidemic in an apartment house which he reported in 1916, every child who came in contact with a case of paralysis had some form of illness, though in many cases it amounted merely to a mild gastrointestinal disturbance. Paralysis was a rare occurrence, a complication rather than a primary accompaniment of the disease. It was comparable to the nephritis which may complicate scarlet fever.

He proposes to change the name of the disease, according to his necropsy findings, to acute lymphatic hyperplasia.

A Factor Influencing the Male Birth Rate.—Many studies and old wives' tales have claimed to demonstrate ways of controlling the sex ratio of offspring, of securing the birth of a male or a female at will. Few, if any, of the investigations have had any scientific background. Banta and Brown[2] report a technic by which the incidence of male and female births among small crustacea, *Moina macrocopa*, was experimentally varied by crowding of the mothers. The number of male young produced parthenogenetically was roughly proportional to the degree of crowding and retardation of production. One, two, four, six and eight females were used per bottle. In the first bottle no males at all appeared. There were a few males in the two-mother bottle, and most in the six-mother bottle. In the eight-mother bottle, the number began to decrease again. More males were produced up to a certain point, the more closely the animals

1. Burrows, M. T.: Is Poliomyelitis a Disease of the Lymphatic System? Arch. Int. Med., 48:33, July, 1931.

2. Banta, A. M.; and Brown, L. A.: Factors Involved in Male Production by Crowded Moina Macrocopa Mothers. Proc. Soc. Exper. Biol. and Med., 28:821, May, 1931.

were packed into the bottle of manure culture solution.

This finding may of course be interpreted and applied to the human species in a dozen different ways by those who wish. Can one say that the scarcer the food supply, within limits, the greater the number of males? That the greater the concentration of female waste products in the media the greater the number of males? That when the struggle for existence is not keen, more females appear?

It is obvious that in this species the male birth rate is in some way directly related to the nutritional condition.

Cardiovascular Renal Disease in Antiquity.—Some students of the modern food supply have felt that cardiovascular and degenerative diseases were closely related to the use of white bread, white sugar, refined foods and canned goods. Paleopathologists have found practically all the diseases of bone which occur today in fossil remains of great antiquity. Diseases of fossil soft parts can naturally much more rarely be shown. Long[3] has demonstrated a case of cardiovascular renal disease in an Egyptian mummy three thousand years old. It is of interest to find this in members of a race which must have lived chiefly on whole grains, and to which sugar was unknown.

Nutritional Muscular Dystrophy.—Since vitamins A, B, C, D, E, and G have been discovered and studied, there is no reason to believe that all the substances necessary in small quantity for normal development are known; that eventually there may not be a vitamin for each letter of the alphabet.

Goettsch and Pappenheimer[4] report a new deficiency disease in guinea pigs and rabbits, characterized by extreme degeneration of the voluntary muscles without obvious lesions in other organs. The muscles were replaced in many places by fat and connective tissue.[5] The dystrophy, apparently, was not occasioned by damage to the peripheral nerve trunks or terminals, which seemed to be normal.[5]

In the diet which induced the condition, vitamin E had been destroyed, and reintroduced by adding the usual source of vitamin E, wheat germ oil. One thinks of the possibility of a new vitamin, closely related to E, as the agent which might correct the syndrome, though the authors make no claim of this kind.

Pituitary in Pregnancy and at Different Ages. Rasmussen[6] compared the weight of the pituitary gland after death, among non-pregnant women under forty, pregnant women under forty, and older women between fifty and eighty years of age. The weight in nulliparous women, he says, is generally held to be about that of the male. The gland enlarges during pregnancy, and the enlargement tends to persist into old age. There has been some question as to which of the three anatomical parts increases in size, the posterior lobe, the pars intermedia, or the anterior lobe.

The enlargement of pregnancy Rasmussan found to occur almost entirely in the anterior lobe, which showed also a slight absolute increase in old age. The pars intermedia was relatively smaller in pregnant and old women than in males and young non-pregnant women. There was no evidence of the supposed increased activity of the pars intermedia in pregnancy.

The anterior lobe is, of course, the source of the growth hormones and the ovary stimulating and pregnancy hormones which have been much studied in the past few years. These autopsy reports harmonize with recent physiological studies of anterior lobe transplants and extract.

3. Long, A. P.: Cardiovascular Renal Disease: Report of a Case 3,000 Years Ago. Arch. Path., 12:92, July, 1931.

4. Goettsch, M.; and Pappenheimer, A. M.: Nutritional Muscular Dystrophy in Guinea Pigs and Rabbits. Jour. Exper. Med., 54:145, Aug., 1931.

5. Rogers, W. M.; Pappenheimer, A. M.; and Goettsch, M.: Nerve Endings in Nutritional Muscular Dystrophy in Guinea Pigs. Jour. Exper. Med., 54: 167, Aug., 1931.

6. Rasmussen, A. T.: Proportions of Various Constituents of Normal Adult Human Female Hypophysis. Proc. Soc. Exper. Biol. & Med., 28:716, April, 1931.

New Orleans—
Where We Meet

MODERN NEW ORLEANS*

Many persons have liked to think of New Orleans as an old world mystery, because of its Vieux Carre; or as the city that hides behind a laughing mask because of its Mardi Gras.

New Orleans has both of these characteristics, but on top of the mystery that surrounds the old quarter and behind that laughing mask that is worn each year at Mardi Gras time there is to be found the stuff that makes New Orleans America's second port and the South's

*By J. J. Rinderle, Editor, Bureau of New Orleans News, New Orleans Association of Commerce.

Canal Street, New Orleans. Skyline of city in background.

greatest city. It is just this mingling of the old and the new and of the fantastic and the serious that has earned for New Orleans the description, "America's most interesting city."

New Orleans has fed on disaster. It has been wiped out by plague and fire. It has been destroyed by conquest. It has suffered floods and practically every other known disaster except an earthquake. Yet, despite the adversities of the past ages, it has become a great city and is growing greater. Its population now is near the half million mark.

A great port is New Orleans: journey out to the river front and you see monster ocean-going vessels with myriad products from all parts of the world; you see chugging steamboats with their picturesque cargoes from up-river points; you see powerful towboats with angular fleets of barges carrying a medley of commodities from many parts of the country; you see port facilities that are worth today at least $200,000,000.

A striking characteristic of the port is the extensive longitudinal wharf system on the east or left bank of the Mississippi River. It is practically a continuous quay for a distance of more than 10 miles. There are no piers extending into the stream. These are not necessary, as the Mississippi is very deep at New Orleans, ranging even in low water stages from 30 to 60 feet near the wharves and 100 to 180 feet in midstream, depths ample to accommodate the largest vessels afloat.

From this great wharf system with miles and miles of steel transit sheds, more than 3,000 ships clear each year, steam down the Mississippi for about 100 miles to its mouth and then enter the Gulf of Mexico on their way to the ports of the world. These ships, incidentally, leave behind them an average of a million dollars a week, represented by money paid to the crews, for repairs, provisions, and other things, and if we consider also the expenditures made by the railroads, trucks, drays, warehouses and the other activities incidental to the commerce of the port, it is evident that the port is New Orleans' greatest industry.

Along the river front, visitors find special interest in the Public Cotton Warehouse built at a cost of over $6,000,000 and having a storage capacity of 461,856 high density bales; as well as in the Public Grain Elevator with a storage capacity of 2,622,000 bushels. The bulk commodity handling plant, where coal, coke, sand, aluminum ore, sulphur and like products are loaded or unloaded by electrically driven belt conveyors, is of peculiar interest, as is also the Inner Harbor Navigation Canal, built at a cost of over $19,500,000, connecting Lake Pontchartrain with the Mississippi River.

Financially, New Orleans is the strongest city in the South with the more than 40 banks and their branches reporting debits in 1930 of $3,530,788,000, deposits of $245,959,689, and resources of $292,680,554.

Industry, too, has found a center in New Orleans, for the city has more than 1,200 industrial units in which 900 different kinds of products are made. Something like 80 per cent of all the men's wash suits are made in New Orleans; the only celotex plant in the world is located here. New Orleans has the world's greatest sugar refinery, as well as the largest cane syrup canning plant and mahogany lumber mill. It has the largest furniture factory South, has great oil refineries, bag mills, industrial alcohol plants, rice mills and many other large industrial units. The huge cottonseed oil industry of the South originated, grew and found its center in New Orleans.

Civic progress in New Orleans has kept step with the march of modernity to be found in the other phases of the city's life. New Orleans has built a $2,000,000 auditorium which can seat more than 10,000; it has built a new criminal courts building; it has paved miles and miles of its streets, made far-reaching im-

provements in its sewage, water and drainage system. Its hotels are of the best to be found and its restaurants have been extolled by epicures the world over.

Canal Street probably typifies the modern progressive spirit of New Orleans. From the impact of the street cars that traveled over it continuously throughout the day and night on five different tracks and the tread of the many thousands of pedestrians, this main thoroughfare needed repairs. New Orleans did not repair it. Instead, it rebuilt the street, the neutral ground and the sidewalks from property line to property line. This beautification treatment cost $3,500,000, but now the 171-foot wide thoroughfare with its terrazzo paving, lined with pink borders, has been accepted as America's most beautiful business street and one of the four best illuminated streets in the nation.

So although New Orleans still retains its old world mystery in the old quarter and still wears its laughing mask at Mardi Gras, the other part of its dual personality gives ample evidence that it is, in addition, a most modern and progressive city.

Book Reviews

Resistance to Infectious Diseases. By Hans Zinsser, M.D., Professor of Bacteriology and Immunity, Medical School, Harvard University. Fourth Edition, completely revised and reset. 651 pages with tables and illustrations. New York: The Macmillan Company, 1931. Cloth, $7.00.

Since its first publication in 1914 under the title of "Infection and Resistance," the book has been one of the accepted volumes in teaching bacteriology.

The new edition has been extensively revised and much new material added to the text. The book is written for the second year medical student to be used as the author's text in his lectures at Harvard, but any physician will be repaid by studying it.

Diabetes. By Orlando H. Petty, A.M., M.D., F.A.C.P., Professor of Diseases of Metabolism, Graduate School of Medicine, University of Pennsylvania. 231 pages with tables and illustrations. Philadelphia: F. A. Davis Company, 1931. Cloth, $2.00.

Written for the layman, this book does not restrict the physician in his manner of treatment. The advice and explanations given in the text are in accord with modern medical teaching.

Southern Medical News

PAN-AMERICAN MEDICAL ASSOCIATION

The Third Congress of the Pan-American Medical Association met in Mexico City, July 26-31, under the auspices of the government of the Republic of Mexico and was well attended by English and Spanish-speaking physicians, and some speaking French and Portuguese. The medical profession of the United States was well represented, particularly the South. The Southern Medical Association was officially represented by its executive officer, Mr. C. P. Loranz, Secretary-Manager.

One of the main objects of the Pan-American Medical Association is to bring together in closer fellowship the medical men of the Western Hemisphere and to enrich scientific medicine by this closer fellowship. Much was accomplished by the Congress in this respect. There were general and sectional meetings and hospital clinics. It was a worth-while medical meeting. The new building of the Department of Public Health of the Republic, a very beautiful and complete public health administrative plant, was headquarters for the Congress and there most of the meetings and exhibits were held. Dr. Rafael Silva, Head of the Department of Public Health of the Republic of Mexico, was President of the Congress, and his principal assistant, Dr. Francisco de P. Miranda, was Secretary-General.

Among the many delightful and greatly enjoyed entertainments was a reception given by His Excellency, President Rubio and Mrs. Rubio, at Chapultepec Castle, the home of the President of the Republic. Hosts could not be more gracious or charming to their guests than were President and Mrs. Rubio.

New Orleans, Louisiana, U.S.A., was chosen as the host city for the Congress next year (1932), the Fourth Congress. The First Congress (1929) was held in Havana, Cuba, and the Second Congress (1930) in Panama, Republic of Panama.

Dr. Francisco M. Fernandez, Havana, Cuba, is President of the Pan-American Medical Association; Dr. J. E. Lopez Silvero, Havana, is Secretary-General; and Dr. M. A. Branley, Havana, Dr. Roberto Gutierrez, United States, and Dr. Francisco de P. Miranda, Mexico City, are Assistant Secretaries.

ALABAMA

Dr. Frank G. Granger, Ashford, has been elected to succeed the late Dr. Russell E. Neff as Health Officer of Houston County.

Dr. V. P. Hughes has moved from Cullman to Eva.

Dr. L. S. Nichols, Geneva, has been reelected Health Officer of Geneva County.

The Jackson County Medical Society and the Jackson County Health Unit held a joint chest clinic recently for examinations and tuberculin tests.

Dr. John Davis, Gordo, has retired from active practice.

Dr. C. C. Perdue and Miss Jessie Moore, both of Mobile, were married in April.

Dr. W. R. Meeker and Miss Isabelle Cowan, both of Mobile, were married in June.

Deaths

Dr. Edward Pickett Hill, McShan, aged 57, died June 29.

Dr. Wesley Alexandria Blair, Brooklyn, aged 48, died June 30 of heart disease.

Dr. Henry Lee Brannon, Marion, aged 66, died April 29 as the result of an appendicitis operation.

Dr. Foy Ernest Blue, Bessemer, aged 34, died June 6 in a Birmingham hospital.

Dr. Edward Taylor Glass, Birmingham, aged 65, died May 29 of heart disease.

Dr. John David Morris, Piedmont, aged 46, died May 22.

Dr. James Cephas Smith, Browns, aged 49, died May 26.

ARKANSAS

The Benton County Medical Society sponsored a free eye clinic recently at Bentonville.

Mrs. J. P. Fergusson has succeeded Miss Gladys Collins as Superintendent of Davis Hospital at Pine Bluff.

Dr. Dewell Gann, Jr., Little Rock, has moved into new offices in the Gann Building.

Dr. J. W. Fleming, Jr., has moved from Smackover to Gladewater, Texas.

Deaths

Dr. John E. Guthrey, El Dorado, aged 47, died June 6.

Dr. Roscoe T. Gephart, Cotton Plant, aged 58, died June 24.

Dr. Silas H. Whitehead, Grapevine, aged 53, died suddenly April 21.

Dr. H. M. Thompson, Marvell, aged 75, died June 2 of heart disease.

DISTRICT OF COLUMBIA

Dr. Lauriston Taylor attended the Congress on Radiology in Paris in July as representative of the Department of Roentgen Ray Measurements of the United States Bureau of Standards.

Dr. Charles W. Stiles, U. S. Public Health Service, recently completed forty years of active government service.

Colonel Charles F. Craig, Medical Corps, U. S. Army, will retire from the Army and as Director of the Army Medical School, Washington, and will become Professor and Head of the Department of Tropical Medicine at Tulane University, New Orleans, Louisiana.

Deaths

Dr. Charles Lewis Waters, Washington, aged 52, died June 17.

Dr. Stephen Harrison Smith, Washington, Major, M.C., U. S. Army, aged 48, died July 4.

Dr. James Clement Allison, Washington, aged 26, died May 18 of pneumonia.

FLORIDA

Thirty-seven applicants for licenses to practice in Florida were approved by the State Board of Medical Examiners at their examination held recently.

Dr. W. H. Daniels, Miami, has moved to Baltimore to practice.

Dr. W. E. Ross, Jacksonville, Chairman of the Duval County Medical Milk Commission, attended the national convention of the American Association of Medical Milk Commissions held recently at Philadelphia.

The St. Lucie - Okeechobee - Indian River - Martin County Medical Society, at a recent meeting, elected Dr. C. L. Davis, Okeechobee, President, and Dr. J. D. Parker, Stuart, Secretary.

Dr. C. D. Whitaker, Raiford, attended the military camp at Fort Barrancas in June.

Dr. James T. Cowart, Tampa, is doing post-graduate work at Manhattan Eye, Ear and Throat Hospital in New York.

The Pasco-Hernando-Citrus County Medical Society met recently for a joint social and business session at the home of Dr. A. B. Cannon, Lacoochee.

Deaths

Dr. George Humphrey Gwynn, Tallahassee, aged 69, died June 8 of uremia.

Dr. Clarence T. Skipper, Jacksonville, aged 50, died May 26 of pneumonia.

Dr. Daniel Atkinson King Steele, Sarasota, aged 79, died July 19.

GEORGIA

Dr. C. E. Waller, former Director of County Health Work of the Georgia State Board of Health, has been appointed an Assistant Surgeon-General of the United States Public Health Service, Washington.

A four-day graduate course for negro physicians, sponsored by Emory University, the State Board of Health, the Rosenwald Fund and Dr. James R. McCord, was held during August at Emory University.

Dr. D. S. Reese and Dr. S. F. Scales, Carrollton, have been attending clinics at the Cook County Hospital, Chicago.

Dr. W. G. Elliott, Cuthbert, has been doing post-graduate work at the New York Polyclinic Medical School and Hospital, New York.

Dr. R. W. Richardson, Macon, has moved to New Orleans.

Dr. H. L. Barrow has moved from Macon to Powersville.

The Chattahoochee Valley Medical and Surgical Association met at Radium Springs, Albany, recently for its thirty-first annual session.

The Harbin Hospital, Rome, has issued its eleventh biennial report, showing progress made since its establishment in 1908.

The Lowndes County Medical Society were guests of Dr. J. M. Smith and Dr. F. H. Thomas, of Valdosta, for a joint social and scientific meeting.

Dr. Joseph C. Read has become associated with Dr. Lon Grove, Atlanta, with offices in the Medical Arts Building.

Deaths

Dr. Alonzo Logan, Concord, aged 81, died May 12.

KENTUCKY

The Fifth District Medical Society was organized recently and is composed of physicians of Jefferson, Carroll, Trimble, Gallatin, Owen and Henry Counties. The new society will meet twice a year. Dr. William E. Gardner, Louisville, is Councilor.

Physicians of Owensboro have opened a Physicians' Exchange to assist patients in locating physicians when needed.

Dr. Allen F. Murphy, formerly of Beckley, West Virginia, has been made Health Director of Mason County to succeed Dr. James H. Hutchings.

The Kentucky State Medical Association and the University of Louisville School of Medicine held their annual summer graduate course at the Louisville City Hospital, which was well attended by Kentucky physicians. The following Louisville physicians were on the faculty: Dr. Granville S. Hanes, Dr. Virgil E. Simpson, Dr. Irvin Abell, Dr. Philip F. Barbour, Dr. Owsley Grant, Dr. John R. Wathen, Dr. Emmet F. Horine, Dr. William Barnett Owen and Dr. Claude T. Wolfe.

A new Department of Bacteriology has been inaugurated at the University of Kentucky which will give a four-year course in technology to prospective laboratory workers.

Dr. Lee Palmer, Louisville, has moved into new offices in the Heyburn Building.

Dr. C. J. Armstrong, Louisville, has moved to the Heyburn Building.

Dr. Benjamin Ralph Wilson and Miss Nannie Coons Ramey, both of Sharpsburg, were married in June.

Deaths

Dr. Herman Feighery Pohlmeyer, Lexington, aged 52, died June 2 of heart disease.

Dr. Edward E. Meredith, Louisville, aged 58, died June 10.

Dr. Benjamin Burrus, Franklin, aged 57, died June 3 of nephritis.

Dr. Marie Clare Boyd, Cynthiana, aged 69, died April 22 of diabetes mellitus.

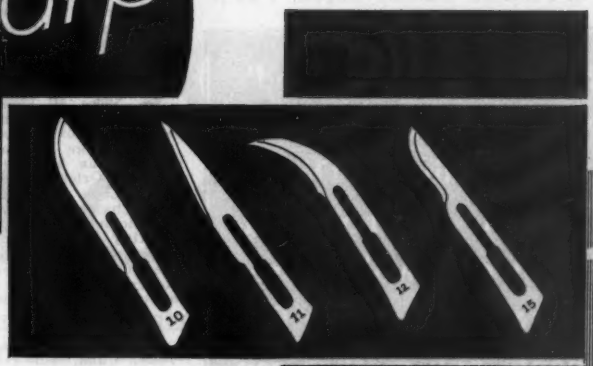
LOUISIANA

Dr. Charles F. Craig, Colonel, Medical Corps, U. S. Army, retired, formerly of Washington and the Army Medical School, has accepted the appointment of Professor and Head of the Department of Tropical Medicine, Tulane University School of Medicine.

The Commonwealth Fund of New York has provided for the establishment of a Department of Preventive Medicine at Tulane University School of Medicine, New Orleans, with Dr. William Harvey Perkins as Head of the new department.

Dr. R. W. Richardson, formerly of Macon, Geor-

Continued on page 34



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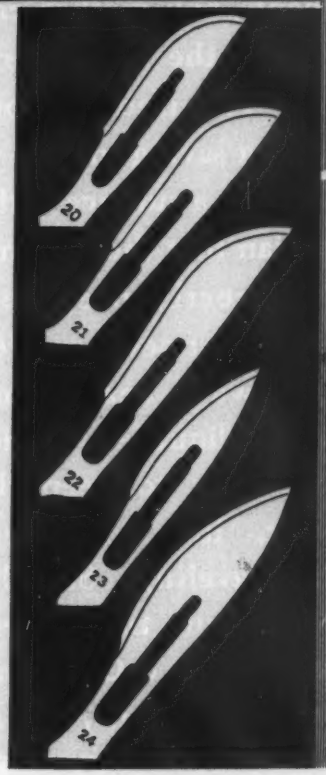

Continued from page 836

gia, has become associated on the staff of the Eye, Ear, Nose and Throat Hospital at New Orleans.

Dr. John H. Musser, New Orleans, has been made a member of the Medical Council of the U. S. Veterans' Bureau.

Gentilly has a new tuberculosis hospital with a capacity of 100 beds.

Dr. George Herrmann, New Orleans, has accepted the Professorship of Clinical Medicine at the University of Texas Medical School, Galveston.

Dr. J. G. Pasternak, Assistant Surgeon, U.S.P.H.S., has been transferred from duty at New Orleans to duty at National Institute of Health, Washington.

Dr. Charles W. Folsom, Assistant Surgeon, U.S.P.H.S., has been transferred from duty at New Orleans Quarantine Station to duty at Marine Hospital, New Orleans.

Dr. C. P. Munday, Surgeon, U.S.P.H.S., has been transferred from duty at Carville to duty at Relief Station at Port Arthur, Texas.

Dr. Harry H. East, Surgeon, U.S.P.H.S., has been assigned to duty at Marine Hospital, Carville, from Port Arthur, Texas.

Dr. Fred P. Burow, Assistant Surgeon, U.S.P.H.S., has been transferred to duty at Quarantine Station, New Orleans, from Marine Hospital.

Dr. D. W. Patrick, Assistant Surgeon, U.S.P.H.S., has been transferred to duty at Quarantine Station, New Orleans, from Marine Hospital.

Dr. Noka B. Hon, Assistant Surgeon, U.S.P.H.S., New Orleans, has been transferred to Hot Springs, Arkansas, for temporary duty.

Dr. George J. Van Dyke, Assistant Surgeon, U.S.P.H.S., has been transferred from Marine Hospital at New Orleans to Cleveland, Ohio.

Dr. Leon J. Menville, New Orleans, was elected Vice-Chairman of the Section on Radiology of the American Medical Association at the Philadelphia meeting.

The Orleans Parish Medical Society at a recent meeting honored two of its deceased members, Dr. Robert Clyde Lynch and Dr. B. A. Ledbetter, by the adoption of resolutions in their memory.

Deaths

Dr. Aristides Agramonte, aged 62, formerly of Havana, Cuba, but recently Head of the Department of Tropical Diseases of the new Louisiana State University Medical School, died suddenly August 17 of heart disease.

A characteristic of Mead's Powdered Lactic Acid Milk No. 1 (containing Dextri-Maltose) is the finely divided soft curd which never clogs the nipple. In a few moments, any mother can carry out the simple procedure required without error — a saving in time to her and an assurance to the physician that the feedings are correctly prepared. This product never curdles; it is always ready, and quickly reliquefied. No ice is necessary to keep the powder. It is convenient while traveling. Samples and literature on request. Mead Johnson & Company, Evansville, Indiana, U.S.A.

MARYLAND

Dr. William Henry Howell, formerly Director of the Johns Hopkins School of Hygiene and Public Health, has become Chairman of the Medical Section of the National Research Council.

Dr. Thomas F. White, Baltimore, has succeeded Dr. Ferdinand O. W. Reinhard as Health Officer-at-Large for Baltimore.

Dr. Stephen D'Irsay, Baltimore, has resigned as Associate in History of Medicine at Johns Hopkins University School of Medicine.

Dr. James M. Fenton, Baltimore, has succeeded Dr. William T. Riley as Coroner of the Central District of Baltimore.

Dr. Bernard P. Herzog, Baltimore, has been made Coroner of the Eastern Section of the City.

Dr. Charles Bagley, Jr., Baltimore, is the newly elected President of the Society of Neurological Surgeons, which met in Richmond recently.

The State Board of Health is busy inspecting canneries, which, under a new law, must pass inspection by the State Board of Health before they can be licensed to operate.

Dr. W. H. Daniels, formerly of Florida, has located in Baltimore for the practice of medicine.

Dr. Marshall Peterson Gordon, Jr., Baltimore, and Miss Gladys Campbell were married in July.

Deaths

Dr. William S. Keister, Towson, aged 44, died July 3 in Walter Reed Hospital as the result of an operation.

Dr. William W. L. Cissel, Highland, aged 66, died May 22 of pneumonia.

Dr. James Marshall Price, Frostburg, aged 62, died May 24 of angina pectoris.

Dr. Charles Alfred Fetterhoff, Baltimore, aged 43, died June 11.

MISSISSIPPI

Dr. John C. Culley, Oxford, President of the Mississippi State Medical Association, has announced

Continued on page 36

DEDICATED TO MEDICINE AND DENTISTRY

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Kansas City	KMBC
Los Angeles	KHJ
Memphis	WREC
Milwaukee	WISN
Minneapolis	WCCO
New Orleans	WDSU
New York City	WABC
Omaha	KOIL
Philadelphia	WCAU
Pittsburgh	WJAS
Portland, Ore.	KOIN
Providence	WEAN
Rochester, N. Y.	WHEC
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Sioux City	KSCJ
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*Barnes, D.J., Brady, M.J., and James, E.M.: American Jour. Diseases of Children, Vol. 39, No. 1—Jan. 1930, page 58.

**Hess, A.F., Weinstock, M., and Rivkin, N.: Proc. Soc. Exper. Biol. & Med. 27:665, April, 1930.

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Continued from page 34

the following Committees—Public Policy and Legislation, Dr. Felix J. Underwood, Jackson, Dr. Henry Boswell, Sanatorium, and Dr. W. H. Anderson, Booneville; Publication, Dr. L. S. Lippincott, Vicksburg, Dr. J. S. Ullman, Natchez, and Dr. D. W. Jones, Jackson; Scientific Work, Dr. T. M. Dye, Clarksdale, Dr. Gilruth Darrington, Yazoo City, and Dr. B. S. Guyton, Oxford; Constitution and By-Laws, Dr. S. W. Johnston, Vicksburg, Dr. J. S. Ullman, Natchez, and Dr. W. H. Frizell, Brookhaven; Community Hospitals, Dr. R. B. Caldwell, Baldwyn, Dr. C. M. Speck, New Albany, Dr. E. R. Nobles, Rosedale, Dr. Y. B. Philpot, Houston, Dr. M. L. Flynt, Newton, Dr. J. P. Culpepper, Hattiesburg, Dr. J. W. D. Dicks, Natchez, and Dr. R. W. Smith, Canton.

The regular quarterly meeting of the Northeast Mississippi Thirteen Counties Medical Society was held recently at Houlka with 200 physicians in attendance.

At the monthly staff meeting of the Vicksburg Hospital recently the following officers were elected: Dr. G. P. Sanderson, Vicksburg, President; Dr. W. H. Parsons, Vicksburg, Vice-President; and Dr. W. E. Akin, Vicksburg, Secretary.

Dr. G. W. F. Rembert, Jackson, has been appointed Chairman of the Section on Eye, Ear, Nose and Throat of the State Medical Association.

Dr. T. B. Abney has located in McComb.

Dr. T. Paul Haney, Lexington, is carrying on the work of the Commonwealth Health Unit in Pike County.

Dr. W. E. Akin has become Resident Physician of the Vicksburg Hospital.

Dr. Guy P. Sanderson, Vicksburg, has entered private practice.

Dr. Walter Johnston, after receiving his degree at Vanderbilt, has become associated with his father, Dr. S. W. Johnston, Vicksburg.

Dr. Bernard Hickman, Louisville, has become associated with his father, Dr. W. W. Hickman.

Dr. H. B. Goodman, Vicksburg, has returned to his home after an internship at Charity Hospital, New Orleans, and is on the staff of the Vicksburg Charity Hospital.

Dr. Malcolm Arnold, Sardis, will soon take up his work in the Naval Hospital at Washington, after completing work at Johns Hopkins.

Dr. W. N. Jenkins, Port Gibson, has been reappointed Health Officer for Claiborne County.

Dr. W. G. Weston, formerly of Louisville, Kentucky, has moved to Vicksburg, where he will be connected with the Vicksburg Clinic.

Deaths

Dr. Samuel A. Scruggs, Lauderdale, aged 77, died June 4 of angina pectoris.

Dr. Victor Wiley Maxwell, Gulfport, aged 40, died June 26 from an operation.

Dr. James Cox Vandiver, Baldwyn, aged 48, died June 9, the result of an operation.

Dr. Charles L. Bufkin, Columbia, aged 57, died in June of pellagra.

Dr. Luther Lee Greer, McComb, aged 50, died July 11 following an operation for appendicitis.

Dr. William Little Davis, Walls, aged 74, died May 4 of myocarditis.

Dr. R. L. Anderson, Inverness, aged 56, died May 31.

Dr. William T. Duke, Glen Allen, aged 41, died suddenly July 23.

Dr. James B. Britt, Blue Mountain, aged 55, died July 28 of heart disease.

Dr. Francis V. McRee, Brookhaven, aged 60, died July 17 of cancer.

Dr. Wilson R. Eatherly, Winterville, aged 74, died July 7 of diabetes mellitus.

Dr. I. T. Woodruff, Batesville, aged 61, died July 11 of pulmonary tuberculosis.

MISSOURI

Dr. Lawrence T. Post, St. Louis, has been made

Continued on page 38

OVER 50 WAYS TO KEEP A DIABETIC PATIENT HAPPY!

JELLIED VEGETABLE SALAD
(Six Servings)

	Grams	Prot.	Fat	Carb.	Cal.
1 tablespoon Knox Sparkling Gelatine	7	6	...	...	...
¼ cup cold water	...	...	...	...	...
1½ cups hot water	...	...	...	...	...
1 teaspoonful whole mixed spices	...	...	...	...	...
½ teaspoon salt	...	...	...	...	...
½ cup vinegar	...	...	...	...	...
½ cup chopped cabbage	50	1	....	3	....
½ cup chopped celery	60	1	....	2	....
¼ cup canned green peas	40	1	....	4	....
¼ cup cooked beets cubed	40	1	....	3	....
Total	10	..	12	88	
One serving	2	...	2	15	

Soak gelatine in cold water for five minutes. Bring to boil water, salt and spices. Pour on gelatine to dissolve it and add vinegar. Strain and set aside to cool. When jelly is nearly set, stir in the vegetables, pour into mold and chill until firm. Unmold on lettuce leaf or shredded lettuce and serve with mayonnaise or salad dressing. Garnish with sprig of parsley or strip of pimento.

CHOCOLATE PUDDING *(Six Servings)*

	Grams	Prot.	Fat	Carb.	Cal.
1½ tablespoons Knox Sparkling Gelatine	30	9	...	...	...
¼ cup cold water	...	...	...	...	...
2 cups milk	480	14	19	24	....
⅔ cup boiling water	...	...	...	...	....
1 square chocolate grated (1 oz.)	30	4	15	9	....
Pinch salt	...	...	...	...	....
Pinch cinnamon	...	...	...	...	....
¼ teaspoon vanilla	...	...	...	...	....
1 gr. saccharin	...	...	...	...	....
Total	27	34	33	546	
One serving	4.5	6	5.5	91	

Soak gelatine in cold water five minutes. Melt chocolate in boiling water. Add gelatine and stir until dissolved. Add milk, salt, cinnamon, vanilla and saccharin. Stir well and chill. When nearly set, beat until frothy, mold and chill until firm. Serve plain or with thin cream or whipped cream.

ACCEPTED AMERICAN MEDICAL ASSN. Correct Use and Results

THE Knox Sparkling Gelatine book of recipes for diabetic patients gives over 50 dish suggestions, two of which are shown above—but they are more than dishes conforming to a diet. They are dishes that help the physician keep the patient on the diet. Knox Gelatine combined with the wholesome foods permitted provides the bulk to satisfy a yearning stomach. The many *different* dishes give a variation that makes eating a pleasure from the standpoint of looks and taste.

Knox dishes give a patient latitude . . . not alone because of variation . . . but because Knox Gelatine is the plain gelatine without *sweetening*, flavoring or coloring. Therefore—it harmonizes perfectly with all the fruits, vegetables and other foods with which it is combined. A ready-prepared gelatin dessert mixture will have as high as 85% sugar—a fact which necessitates that physicians carefully prescribe KNOX Gelatine for dishes that will not violate the most rigid diet. Send for the book, using the coupon provided for your convenience.

KNOX *is the real* GELATINE

If you agree that recipes like the ones on this page will be helpful in your diabetic practice, write for our complete Diabetic Recipe Book—it contains dozens of valuable recommendations. We shall be glad to mail you as many copies as you desire. Knox Gelatine Laboratories, 408 Knox Ave., Johnstown, N. Y.

Name.....*Address*.....*City*.....*State*.....

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Durham, N. C.

WARD PATIENTS. Duke University cannot give charity treatment to all who apply, therefore patients whose incomes are less than $15 per week should apply for examinations or for admission to the hospital wards (whether full pay, part pay or free), through their family physicians, to the Duke Public Dispensary (Tel. Durham F-131) on the days and hours listed below. The charge for examinations in the Duke Public Dispensary is $2, exclusive of X-rays and special tests, and the ward rate is $3 per day, if the patient can pay. Welfare departments and churches should assist in the payment for the needy.

SCHEDULE OF THE DUKE PUBLIC DISPENSARY. White patients at 1 p. m.; colored at 3 p. m. **Medicine and General Surgery:** Daily, except Saturdays, Sundays and holidays. **Obstetrics, Women's Diseases and Urology:** Tuesdays and Fridays. **Children's Diseases, Ear, Nose, Throat and Dentistry:** Mondays and Thursdays. **Eye:** Thursdays. **Asthma, Hay Fever and Skin Diseases:** Tuesdays. **Syphilology:** Wednesdays. **Orthopedics:** Mondays and Wednesdays.

PRIVATE PATIENTS. Patients who can pay the private rates of $5 to $8 per day may at any time, through their family physicians in consultation with any member of the hospital staff, reserve private rooms by telephoning to the admitting office (Durham F-131). Appointments for private examinations and treatment may be made in advance by telephoning to members of the hospital staff.

Every effort is being made to cooperate with the medical profession, and patients are asked to return to the physicians who referred them to the hospital and public dispensary.

This announcement of the methods of admission is made to avoid misunderstanding, delay or unnecessary trips.

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Of

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3. Schilling Counting Plates $3.50
4. Schilling Hematological Outfit $40.00

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ST. LOUIS, MO.

Continued from page 36

Editor of the American Journal of Ophthalmology.

Dr. Florian Harms, Moberly, has resigned as Junior House Physician of the Wabash Hospital to enter private practice in Salisbury.

Dr. Clifton Smith, Jefferson Barracks, has been named Assistant Resident Physician of State Hospital No. 2 at St. Joseph.

Dr. Alvin J. Lorie, Kansas City, was elected Vice-President of the Midwest Section of the American Laryngological, Rhinological and Otological Society at their meeting recently in St. Louis.

Dr. Eugene A. Scharff, St. Louis, has been named Chief of Staff of the new St. Louis County Hospital.

Dr. E. H. Skinner, Kansas City, has been made Vice-President of the American Radium Society.

Dr. Oliver C. Sheley, Independence, recently celebrated his seventy-sixth birthday. Dr. Sheley has practiced in Independence since 1890.

Beryl Anscombe is the newly appointed Superintendent of the new Menorah Hospital at Kansas City.

Dr. Daniel Morton, St. Joseph, has been reappointed Chairman of the Medical Service Committee of the Welfare Board of St. Joseph.

Dr. Joseph E. Wheeler, Jefferson Barracks, and Miss Jane Cannell were married June 20.

Deaths

Dr. Arista T. Hayman, St. Louis, aged 57, died suddenly July 8.

Dr. George Morgan Moore, Eldon, aged 69, died June 28.

Dr. James S. Richardson, Wentzville, aged 51, died June 3 of pneumonia.

Dr. Albert L. Gray, St. Joseph, aged 75, died June 8.

NORTH CAROLINA

Dr. W. P. Wheless has recently moved to Spring Hope to locate.

Dr. Charles S. Grayson, High Point, has been elected mayor of that City.

The North Carolina, South Carolina and Virginia Hospital Associations had a joint meeting recently at which Dr. Harold W. Glascock, Raleigh, was elected President of the North Carolina Hospital Association.

Dr. Wilburt C. Davison, Dr. Alfred R. Shands, Jr., and Dr. Bayard Carter, all of Duke University, Durham, recently went to Saluda for the meeting of the Southern Pediatric Seminar.

Duke University has made the following additions to its faculty: Dr. Edwin C. Hamblen, Associate Professor of Obstetrics and Gynecology, and Dr. Bayard Carter, Professor of Obstetrics and Gynecology.

Dr. William P. Richardson, Secretary of the Caldwell County Medical Society, and Miss Treva Hedrick, both of Lenoir, were married recently.

Dr. Frederick M. Patterson, Greensboro, and Miss Marion Willis Reeves were married June 10.

Dr. Herbert J. Gorham, Durham, and Miss Aileen Ross were married recently.

Deaths

Dr. Ira James Stoner, Durham, aged 62, died June 22 in the Duke University Hospital.

OKLAHOMA

Dr. Calhoun Doler, Elk City, has been appointed Superintendent of Western Oklahoma State Tuberculosis Sanatorium at Clinton.

Dr. Elmer E. Darnell, former Superintendent of Western Oklahoma State Tuberculosis Sanatorium, has resigned.

The Woman's Auxiliary to the Oklahoma State Medical Society has elected the following officers: Mrs. Earl D. McBride, Oklahoma City, President-Elect; Mrs. Fred Clinton, Tulsa, First Vice-President; Mrs. H. G. Campbell, Shawnee, Secretary; and Mrs. Carroll M. Pounders, Oklahoma City, Treasurer.

The Southern Oklahoma Medical Association held its eleventh quarterly session at Chickasha in June.

Continued on page 40

Two-Dose Toxoid Immunization *protects against Diphtheria*

CLINICAL EVIDENCE shows that Diphtheria Toxoid Mulford develops protective immunity in 90% to 95% of young children and in 85% to 95% of those over 15 years.

Immunity is produced quickly (within 6 to 8 weeks instead of 3 to 6 months).

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Cystoscopy	Bronchoscopy
Orthopedics	Regional and
Thoracic Surgery	Local
Esophagoscopy	Anaesthesia

For descriptive literature, terms, etc. address the Director

Continued from page 38

Deaths

Dr. Benjamin L. Applewhite, Tecumseh, aged 89, died May 15 of acute bronchitis.

SOUTH CAROLINA

The Greenville County Medical Society had as guest speakers at a recent meeting Dr. Edgar F. Fincher, Jr., and Dr. William A. Smith, both of Atlanta.

The State Board of Health has recently been reorganized and new members appointed.

Dr. Kenneth M. Lynch, Charleston, Dr. J. R. Allison and Dr. P. V. Mikell, Columbia, Dr. Robert B. Taft, Charleston, Dr. E. W. Carpenter, Greenville, and Dr. William Weston, Columbia, were on the scientific program of the A.M.A. meeting at Philadelphia in June.

Deaths

Dr. Wade D. Fowler, Simpsonville, aged 68, died May 31 of arteriosclerosis.

Dr. Francis Eugene Harrison, Abbeville, aged 68, died June 15 of uremia.

TENNESSEE

Dr. Waller S. Leathers, Dean, Vanderbilt University School of Medicine, Nashville, has been reelected President of the National Board of Medical Examiners.

Dr. Austin F. Barr, Pulaski, has resigned as Director of the Health Unit of Giles County.

Dr. Wallace L. Poole, Johnson City, has been appointed Health Officer of Washington County to succeed Dr. Samuel Shaw Moody, resigned.

Dr. J. B. Naive, Beverly Hills Sanatorium, has been elected President of the Knoxville Council of Social Agencies.

Dr. S. S. Moody, Johnson City, is doing postgraduate work at Vanderbilt University School of Medicine, Nashville.

Dr. W. E. Lindsay has moved from Memphis to Winchester.

Dr. L. L. Barnes, Sweetwater, is doing post-graduate work at Vanderbilt University School of Medicine, Nashville.

Dr. Robert L. Mason has become associated with the Polyclinic at Memphis.

Dr. Jacob Alperin has become associated with Dr. N. S. Stern, Memphis.

A joint meeting of McMinn, Monroe, Roane and Loudon Counties Medical Societies was held in the Court House in Athens recently.

Deaths

Dr. William Andrew Lucas, Knoxville, aged 54, died June 20 of heart disease.

Dr. E. L. Watkins, Knoxville, aged 67, died May 22 in the National Home for Disabled Volunteer Soldiers, Johnson City.

Dr. Edward Burnett Wise, Chattanooga, aged 80, died June 23.

TEXAS

Austin is carrying on an active war against diphtheria through its Board of Health by giving immunization to children.

The Medical and Surgical Clinics held in Fort Worth recently were well attended by physicians of Tarrant County.

Dr. John O. McReynolds, Dallas, has been reelected President of the Medical Veterans of the World War at the Association meeting in Philadelphia recently.

Dr. P. A. Baze and Dr. Oscar Huff, Mason, have recently leased the Mason Sanitarium.

Dr. L. N. Markham, Longview, is making plans for the expansion of the Markham Hospital at Longview.

Dr. Charles Phillips, formerly Professor of Pathology, Medical College of Virginia, Richmond, has become Director of Laboratories at the Scott and White Clinic, Temple.

Continued on page 42

Patient Types . . .

The Convalescent

DURING the period of convalescence, Petrolagar is prescribed with great success. It mixes thoroughly with bowel content, mechanically protecting the delicate membrane as does the natural mucus.

Petrolagar avoids any apprehension or anxiety as to bowel function during the days when the patient is slowly regaining strength.

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Louisville, Kentucky

Continued from page 40

Dr. J. W. Fleming, Jr., has moved from Smackover to Gladewater.

Dr. George Herrmann, formerly of Tulane University Medical School, New Orleans, has accepted the appointment of Associate Professor of Medicine in the University of Texas School of Medicine, Galveston.

Dr. E. H. Newton, Corsicana, has been elected President of the Rotary Club of that City.

Dr. L. C. Brown, Eastland, has been appointed City Health Officer, succeeding Dr. E. R. Townsend.

The original work on typhus of Dr. Bedford Shelmire, Dallas, on exhibit at the A.M.A. meeting in Philadelphia, was awarded the silver medal.

Dr. Giles Day, formerly of Fort Worth, has moved to Galveston to become Superintendent of the new Galveston State Psychopathic Hospital.

Dr. S. E. Cramer, Electra, was recently unanimously elected to honorary membership in the Wichita County Medical Society.

At the fortieth commencement exercises of the University of Texas School of Medicine, Galveston, diplomas were received by seventy-three members of the Senior Class in the School of Medicine and seventeen in the School of Nursing.

Dr. J. R. Barcus has moved from Big Spring to Gladewater.

Dr. C. M. Beavens has moved from Temple to Port Arthur.

Dr. C. W. Boring has moved from Port Arthur to Breaux Bridge, Louisiana.

Continued on page 44

Classified Advertisements

FOR SALE—Large well established practice. 75 per cent office work. Easily $15,000 per year. In city of 60,000. No real estate or office equipment for sale. Am moving my equipment to a larger city. If you are interested and have some cash, write to Box 281, Waco, Texas.

FOR SALE—Owing to the death of Dr. S. D. Rice, his estate offers for sale all his office equipment and library, at reasonable price. Wire, write or phone Mrs. S. D. Rice, Gainesville, Florida.

FOR SALE — McCaskey System Cabinet; large model; slightly used; in excellent condition; cost $285.00; will sell at real bargain. Joseph H. Smith, M.D., Farmville, Virginia.

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PATHOLOGIST desires place as Director of Laboratories or Associate; will also consider well established group. Age 34; married; 7 years in Clinical Pathology and teaching; grade A training; excellent references. C. W., care Journal.

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Packages containing 1, 2, 5 and 10 tubes and needles.

Large quantities sent in ice chests.

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Supplied in both individual and bulk packages. Toxin-Antitoxin from horse origin supplied on all unspecified orders. Prepared by the most recently improved methods.

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℞ 5 to 15cc, by injection direct into the bladder.

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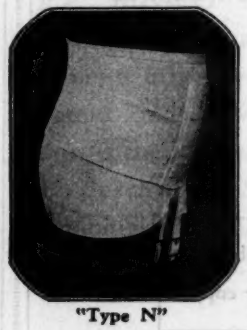

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Continued from page 42

Dr. E. A. Chandler has moved from McCamey to Baytown.

Dr. M. H. Crabb has moved from Diboll to Fort Worth.

Deaths

Dr. Luther V. Bates, Arlington, aged 55, died in May of cerebral hemorrhage.

Dr. James D. Osborn, Sr., Cleburne, aged 85, died April 29.

Dr. Mandred Leslie Hanks, Corbet, aged 59, died suddenly June 11.

Dr. Robert Burton Walker, Dallas, aged 35, died May 30 of pulmonary tuberculosis.

Dr. John Charles Ludwig, Corpus Christi, aged 93, died May 2.

Dr. Ralph John Pantzer, San Saba, aged 37, died June 6 of tuberculosis.

Dr. Joseph Dean Oldham, Raymondville, aged 69, died May 5.

Dr. E. T. Read, Keller, aged 72, died April 20 of heart disease.

Dr. Tom J. Denson, Cameron, aged 56, died May 13 of heart disease.

Dr. Claude Abner Searcy, Bryan, aged 50, died May 3 of heart disease.

Dr. Thomas Grant Bates, Lubbock, aged 65, died May 9 of cerebral hemorrhage.

Dr. William McCall Morgan, Lockhart, aged 61, died May 5.

Dr. Job L. Hammond, Paris, aged 59, died April 10 following an operation.

Dr. William Henry Alexander, Floydada, aged 66, died March 31 of heart disease.

Dr. James Marion Puckett, Mineola, aged 67, died March 2 of heart disease.

VIRGINIA

At a recent meeting of the Virginia Academy of Science a new section—Section on Medical Sciences—was organized and the following officers elected: Dr. J. Shelton Horsley, Richmond, Chairman, and Dr. J. E. Kindred, University of Virginia, Secretary.

Dr. A. L. Carson, Jr., has located in Fairfax for the practice of medicine.

Dr. James S. Richardson has moved from Hurley to Grundy.

Dr. G. A. Ezekiel, Richmond, has been promoted to Colonel in the Medical Reserve Corps, U. S. Army.

Dr. W. F. Draper, Assistant Surgeon-General, U. S. Public Health Service, Washington, has been transferred to Richmond, where he will be State Health Commissioner, vice Dr. Ennion G. Williams, deceased.

Dr. Thomas N. Spessard has located in Roanoke, where he will practice neurology and neuro-surgery.

Ninety-six applicants were recently granted licenses to practice medicine in Virginia by the State Board of Medical Examiners.

Dr. W. H. Walcott has moved from Fairfax to Chatham to become Director of the County Health Unit of Pittsylvania County.

Dr. W. H. Venable has moved from Farmville to Chatham to become physician to "Chatham Hall."

Dr. Joseph B. Graham has become associated with the Department of Surgery of Memorial Hospital at Richmond.

Dr. S. G. Miller has moved from Warm Springs to Piney River.

Dr. B. A. Rice, Forest, has been spending some time in Europe.

The Southside Virginia Medical Association will hold its next meeting in Piedmont Sanatorium in September.

Dr. Richard Moncure Reynolds, Norfolk, and Miss Margaret Elizabeth Sheppard were married in June.

Dr. Warren Stone Bickham, Richmond, and Miss Alice Martin were married in June.

Dr. William Carey Henderson, Nassawadox, and Miss Mary Ferebee were married in June.

Dr. James Clarence LeFon, Norfolk, and Miss

Continued on page 46

A New Book

ALLERGY

And Applied Immunology

A Handbook for Physicians and Patients, on Asthma, Hay Fever, Urticaria, Eczema, Migraine, and Kindred Manifestations of Allergy.

By WARREN T. VAUGHAN, M.D.

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365 pages, with illustrations and tables.

Because of the great interest manifested in the study of allergy during recent years, Dr. Vaughan has felt there is need for an authoritative work that would appeal especially to the general practioner of medicine and the laity. This new book covers the field in a simple yet complete manner so that the subject is made entirely clear. Invaluable for your patient.

Part I. ALLERGY. Which tells of the nature of allergy and how it affects the individual.

Part. II. ALLERGENS. Which tells of the substances which provoke symptons.

Part III. DIAGNOSIS. Which tells of the methods by which we determine the causes of an allergic patient's illness.

Part IV. THERAPY. Which tells of the measures taken to secure relief.

Part V. PROGNOSIS. Which tells of what results we may expect from treatment.

Part VI. MANIFESTATIONS OF ALLERGY. Which tells of the symptons that may be associated with this malady.

Part VII. APPLIED IMMUNOLOGY. Which tells of other diseases in the treatment of which allergic or immunologic principles are employed.

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TO IMPROVE THE
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When sugar is added with salt to stews, meat loaves and pot-roasts, the improved flavor will delight you.
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A dash of sugar to a pinch of salt, or equal parts of each, are good rules to follow in meat cookery. Try this idea in stews, meat loaves, pot-roasts or braised meat dishes — also in vegetables. Most foods are more delicious and nourishing with sugar. The Sugar Institute, 129 Front Street, New York.
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Continued from page 44

Katheryn Elizabeth Schooles were married in June.

Dr. Cyril James Crozier Kennedy, Richmond, and Miss Edna Rose Wright were married recently.

Dr. Alexander Gordon Gilliam, Petersburg, and Miss Laura Edmondston Venning were married in June.

Deaths

Dr. Reid Arnold Rosser, Lynchburg, aged 59, died July 3 as the result of a fall from a window.

Dr. James William Graham, Belfast Mills, aged 55, died July 16.

Dr. Leonidas Camden Dickerson, Stuart, aged 62, died May 22 from diabetes.

WEST VIRGINIA

The Kanawha County Medical Society had as its guest speaker at a recent meeting Dr. Winchell McK. Craig, of the Mayo Clinic, Rochester.

Dr. Luther C. Davis, Fairmont, has been appointed as a member of the State Board of Nurses' Examiners to succeed the late Dr. Harry M. Hall.

Dr. James Stewart, Wheeling, is associated temporarily with Dr. E. L. Jones at the Wheeling Clinic.

Dr. Bruce Clark has located at Winifrede, his former home, for the practice of medicine.

Dr. Archer A. Wilson, Charleston, has opened offices in the Professional Building, where he will practice neurology and neurological surgery.

Dr. William Price Bittinger, Summerlee, and Miss Susannah Brient were married in May.

Deaths

Dr. E. W. Strickler, Fairmont, aged 66, died July 1.

Dr. J. J. Goff, Parkersburg, aged 67, died May 27.

Dr. A. S. Bosworth, Elkins, aged 72, died July 17 of cancer.

Dr. Thomas McClellan Wilson, Elkins, aged 69, died May 22 of heart disease.

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